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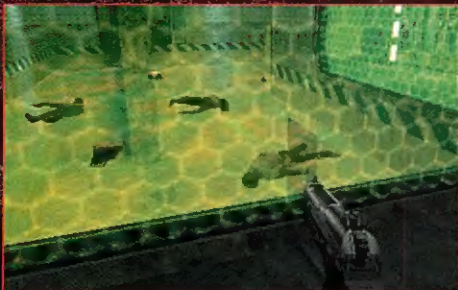
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COVER: The X-Files' Fox Mulder and Dana Scully are moving to Los Angeles. For further details, see page 24 for our complete Television coverage. ABOVE: Donato Ginacola's painting for Raunok: Omega Corp gives just a hint of what you'll find in the Gallery on page 76.

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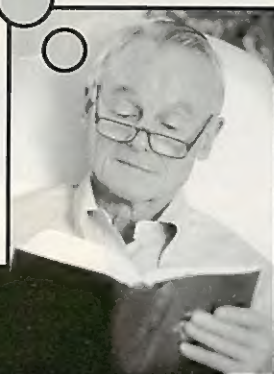
Jaromir Stavan did not believe that one could harness a muse. Juan De Bingo was about to prove him wrong.

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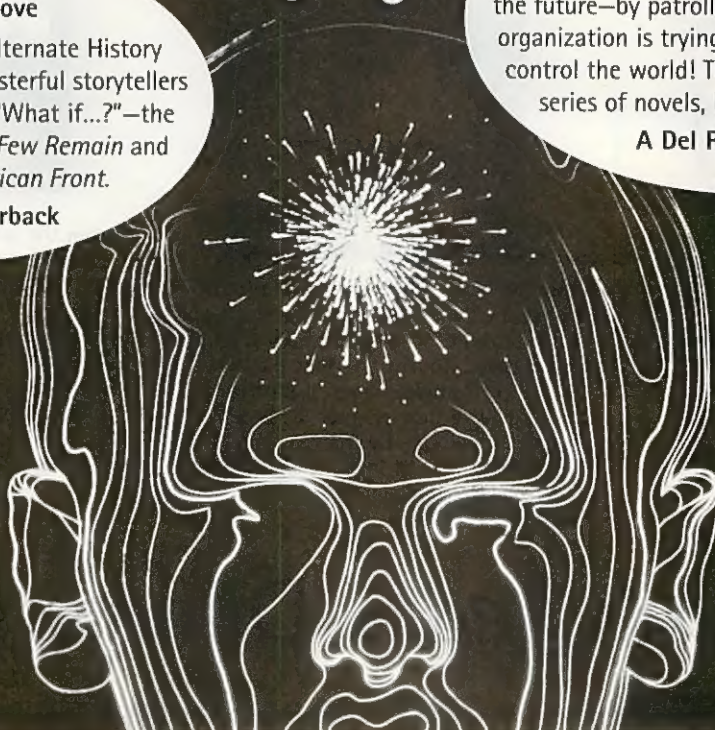
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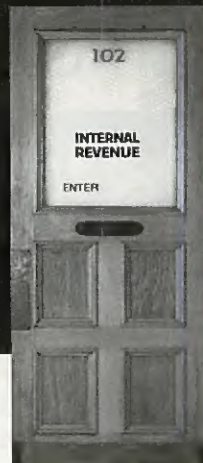
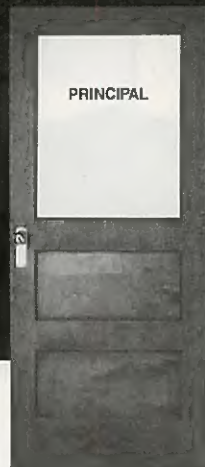
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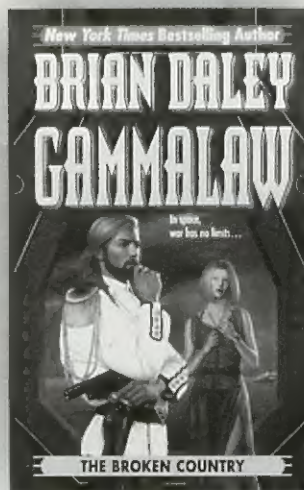
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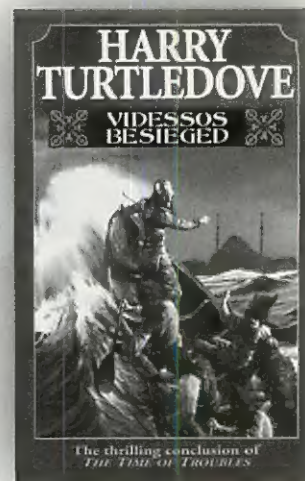
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EDITORIAL

Please don't hate us for being beautiful here at *Science Fiction Age*.

I HAD HOPED THAT IN THIS EDITORIAL I'D BE able to thank you for honoring the work we do here at *Science Fiction Age*. Last weekend the 56th World Science Fiction Convention was held in Baltimore, Maryland, and one of the high points for me was the Hugo Awards ceremony, where Stephen Baxter, Geoff Landis, Robert Reed, and I were nominated in competition with the many other wonderful writers and editors in the SF field. The three authors were up due to the magnificent stories I had the privilege of publishing in 1997, while I made the ballot for the lesser talent of having had the good sense to publish them. I did not get my hand on one of those trophies—unless admiring one at the *Locus* dealers table counts—but as it turned out, one of our readers in attendance said something to me that was far more intrinsically important than any statuette.

As I was in the midst of rushing from one panel to another, a man came up beside me to tell me how much he was enjoying the magazine. What I found most rewarding was the story of exactly *how* he'd become a fan of the magazine. It seems that he'd ignored *Science Fiction Age* for years, feeling that because of our slick exterior that it couldn't possibly be a serious Science Fiction magazine. How could the stories be any good, he thought, when the magazine did not look like the traditional digests from which Science Fiction first sprung? So he'd passed us by for years, even as we'd won a Nebula Award and placed the occasional story on the final Hugo ballot.

But then he saw *this* year's Hugo ballot, where we had managed to garner three of the top fiction slots. Our presence there was the evidence against which he had no defense, and so he decided to finally try an issue, and having tried an issue decided to subscribe. He had been converted, and from what I could tell from talking to as many of the over 5,600 attendees as I could, there were other converts as well.

After years of attending conventions and talking up *Science Fiction Age*, I have decided to call this the "Don't hate me because I'm beautiful" syndrome. Many hundreds, if not thousands, of cheap pulp magazines flourished in the 1940s, with the only survivors into the present day being in the genres of science fiction and mystery. Because of this, many fan readers believe that the pulp digest format is the only way for a true SF magazine to go, that choosing a different format is a way of turning one's back on the glorious traditions of SF. While we continue to improve our

looks, there are some longtime hardcore SF fans who have a dim view of anyone monkeying with the way things have always been done here in our genre.

And so I value what that fan had told me before vanishing back into the crowd. The hard work entailed in grabbing a substantial portion of the ballot had proven worthwhile. His subscription was more valuable than any trophy, for his action itself was at heart what I always hoped would be the result of any awards themselves that would come. Any accolades that my writers bring me are clarion calls to those who have not yet jumped on the bandwagon, a reminder to fans that they should come join the party. That convert and his words are valuable to me because I'd rather have a thriving magazine and no trophy than a trophy and no magazine. And as I write these words which are to appear in the first issue of our seventh year, the mere act of survival is a trophy itself.

Now on the other hand—that doesn't mean that next year, when it comes time to vote on the Hugo Awards to be handed out in Australia, that I don't hope you'll allow me and my writers to have *both*!

A convention is much more than just awards, however. People and the memories they leave with you are far more important than chrome rockets. I had more memorable encounters than can be contained in an issue of *SFA*, let alone a simple Editorial, but some of the highlights included:

My lunch with Jack Williamson, which had me feeling as if I was dining with Science Fiction incarnate. His tale of how being his family's eldest child in the New Mexico desert before the advent of television in the second decade of this century gave birth to his imagination gave me more of a feel for the way it used to be than any SF history. The ever-entertaining Adam-Troy Castro, whose Vossoff and Nimnitz stories have been gracing these pages for years, continued his stand-up routine over dinner. And hearing Bob Silverberg tell me of *SF Age*, "It's better than it has any right to be."

But SF isn't only about those who have already made it. I also took part in the con's writers' workshop and met three beginners who seemed willing to put in the hard work required. Chatting (and playing pool) with recent graduates of the Clarion and Odyssey writing workshops kept me confident that the future of Science Fiction would be bright.

Thanks for continuing to keep *us* a part of that future.

Scott Edelman

To the Editor:

It's great to read another delightful rant from Hellraisin' Harlan, masquerading as a review, and for a good cause, Di Fate's *Infinite Visions*. I, too, felt this was such a tremendous addition to the field, that I immediately called the publisher and ordered two dozen copies—then gave them away to my favorite clients. This is an art reference book *non pareil*, a masterful paean to the genre, and no art enthusiast—whether a beginning or “established” collector—can do without it. There's not a compendium in memory that can compete with this one, and how right that Ellison, in his inimitable way, is the one to tell us so. To paraphrase his “This is a book for people who want to enjoy the hell out of Art,” this is a review for people who want to enjoy the hell out of language.

Jane Frank
Worlds of Wonder

Dear Mr. Edelman:

Your September issue is superb! First of all, I compliment you on collecting six top-notch tales, particularly Robert Reed's “The Cuckoo's Boys.” This story is the finest I have read this year. Brilliant!!

I do, however, have two somewhat inconsequential but hopefully answerable questions:

First, concerning Dan Perez's excellent Fall TV report: While I enjoyed the article immensely, how could he neglect to mention one of the best-acted and -written series on television, *Earth: Final Conflict*?

Secondly, about Terry Bisson's engaging “First Fire”: Is it my notoriously faulty memory, or is the last line of the story identical to the last line of Arthur C. Clarke's classic short story “The Nine Billion Names of God,” which is available in the collection *The Science Fiction Hall of Fame, Volume One*?

Robert Ciccotosto

Skipping over the returning series Earth: Final Conflict wasn't a deliberate slight, I assure you, but rather an editorial oversight, one which we hope never to repeat. Terry Bisson's actions were entirely intentional, however. The loving nod to Clarke's classic was part of the pleasure of “First Fire,” one which the author hoped you would catch.

Dear Mr. Edelman:

How refreshing! Thank you for printing the story entitled “The Colonel in Autumn” by Robert Silverberg in the May issue. I'm not a subscriber because I have two residences in

two states and often travel between them. My mail situation is difficult enough without having magazine subscriptions, but I purchase *Science Fiction Age* whenever I can.

Mr. Silverberg's story is refreshing because it's not the “same old, same old” treatment of aliens arriving on the Earth. His aliens had an agenda of their own and they weren't created in the psychological image of man; that is, they failed to behave in a manner that man expected. They came, walked around as if they owned the place, and generally did their own thing with little regard for the natives.

How would an alien culture act toward us? Like nothing we can imagine, I'll bet, but Mr. Silverberg's ideas are probably closer to the “truth” than anything.

There is a precedence for this type of behavior in our history. Consider the manner in which Columbus and his men treated the natives in the New World. There are certainly parallels between these historical accounts (and the various movies) and Mr. Silverberg's aliens. Was this his source for the concept, I wonder?

A fine magazine, and keep up the good work. Incidentally, the first thing that I read when I get a copy is the Science Department. My degree is in physics and I enjoy the enlightened discussions on various scientific subjects, a refreshing change from the stuffy, scientific journals.

Hal Russell

Dear Mr. Edelman and *Science Fiction Age*:

I have been a subscriber to *SFA* for little over a year now, and I would like to congratulate you for the fine work you do in your magazine. Also, congratulations on your individual Hugo nominations, Mr. Edelman. Which brings me to the heart of this letter, getting more information about the Hugo Award.

Since I was bitten with the science fiction bug about three years ago, I have read about 60 science fiction novels. Trying to find as much information as possible about good science fiction books I quickly discovered the two major awards: the Hugo and the Nebula. Through research I got a list of all the yearly winners of both awards. But I have much more information about the Nebula. With two opinions being better than one, I would love to have the same data about the Hugo nominations. But with their roving Hugo convention I do not even know yet who to contact in their organization.

I was hoping you would know who in the Hugo association I should contact to improve

my data about their nominations for novels, especially for the last 20 years or so. Even better for me would be that your magazine's library includes that information easily available. If it does, I'll be happy to pay for your time in putting it together.

Stephen Jende

Don't pay me, pay Advent: Publishers, Inc., publishers of the newest edition of Howard DeVore's indispensable book, The Hugo, Nebula and World Fantasy Awards. For more information, drop them a line at P.O. Box A3228, Chicago, IL 60690.

Dear Editor:

Why not give the true story titles on the cover of your magazine?

Christopher L. Exner

We see the cover as a billboard advertisement, where potential new readers at the newsstand have only a split second in which to decide whether to pick up a copy. If we haven't grabbed them in that nanosecond, then the eye moves on to the next magazine. Towards that end, we boil the meat of the story down to what we hope will be an instantaneously evocative nugget that will catch the reader's attention and cause him or her to pick up the magazine and see the real stories inside. Additionally, some story titles—such as those of Adam-Troy Castro's manic Vosssoff and Nimmitz tales—are sometimes 14 words long, and would not leave room on the cover for the story titles by any of the other writers, let alone the title of the magazine itself!

Dear Mr. Murphy:

The May issue was great. The two time-travel stories and the lunar novella were excellent. The other two weren't bad. Humor is just so hard to write, and in the case of “The Hitchhiking Effect,” the central idea was compressed in too little plot. I forget who said it—“75% of Science Fiction is garbage, but then, 75% of everything is garbage”—but *Science Fiction Age* is beating the odds. Keep up the good work.

My new story should be ready soon. I'm hoping you will judge it among the 25% that is the good stuff.

Frank Horbelt

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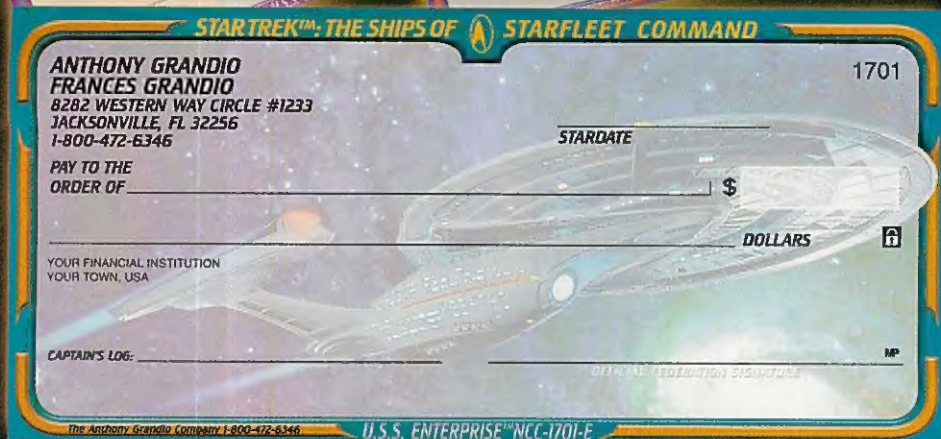


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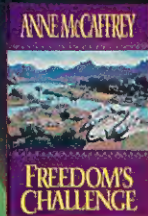


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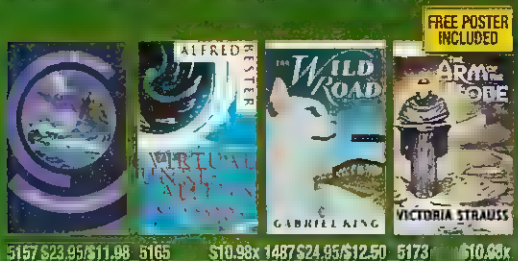
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BOOKS

By D. Douglas Fratz, Richard Parks, and Paul Di Filippo

Wil McCarthy's near-future thriller takes nanotechnology one step beyond.



ABOVE: *In Bloom*, the future of the solar system itself is in doubt. (Cover art by Rick Berry.)
BELOW: Two other of this season's strong titles.

WIL MCCARTHY HAS BEEN getting a fair amount of notice over the past five years with his fast-paced, hard-science-fiction novels featuring interstellar travel, contact with aliens or their artifacts, space battles, and nanotechnology. In his fifth novel, *Bloom* (Del Rey, hardcover, 310 pages, \$23.95), McCarthy once again uses these same elements, but this time the alien lifeforms being encountered are man-made.

Bloom is set in the early 22nd century, 20 years after the Earth, and then the entire inner Solar System, is taken over by an amazingly rapid-growing artificial life form of uncertain origin, called Mycora, which consumes all organic (and much inorganic) matter. The remnants of humanity that escaped Earth before being consumed exist only in the asteroid belt and the moons of Jupiter, and even there, are constantly fighting to keep the Mycosystem at bay as spores drift out from the inner system. But now it appears that the Mycora are

evolving in their ability to overcome man's defenses.

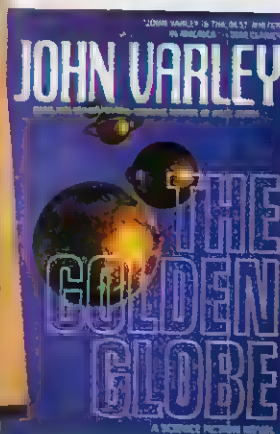
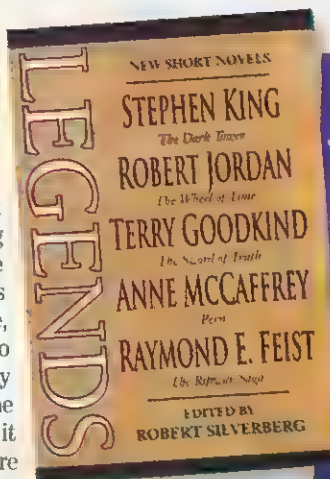
One of the human enclaves, centered on the Jovian moon of Ganymede, and called the Immunity, decides to send a small spaceship, the *Louis Pasteur*, with specially designed defenses against the Mycora, to penetrate the inner system and place sensors around Mycora-infested Earth and Mars. John Stasheim, an amateur journalist whose main job is as a cobbler, is chosen to go on the mission, along with seven other crew members, to serve as historian and journalist.

As John and the other crew are preparing their ship, a "bloom" of Mycora occurs in the bay where their ship is stored, and one of their crew is consumed fighting it. The *Louis Pasteur* must embark on its mission prematurely. The bloom appears to have been a terrorist act, and the Temples of Transcendent Evolution, a "religious" group sympathetic to Mycora, is suspected.

As the *Louis Pasteur* heads toward one of the many "Gladholder" enclaves in the asteroid belt, to barter for more fuel and supplies, the crew gets to know each other and their assignments. John begins by interviewing the other crew members and trying to understand their mission. His other assigned job is to manually monitor their computer processor resource allocation and reassign priorities if needed. He also spends a lot of time taking apart and reassembling the electronic components in the ship, and in doing so finds that the ship has been "bugged." One of the crew members also introduces John to cellular automata, computer simulations that in theory could model things like the spread of Mycora, and he begins to spend much of his time setting up and watching computer simulations of the "Game of Life."

The Mycora are an astonishingly original concept, one of the most chilling versions of nanotechnology yet envisioned. McCarthy is able to make the idea of an organism able to reproduce and grow at amazing speed, eating any matter in its path, utilizing almost any energy source (even radio signals) seem quite believable. The pacing of the book is also excellent, despite the need for numerous conversations between crew members during months of space travel. McCarthy has a real talent for hard-SF concepts and thriller plotting.

But only if you don't look too close. McCarthy is prone to annoying inconsistencies in the smaller details. The Mycora finding enough matter to fill the space between Venus and Mars with structures visible to the naked eye stretches the imagination, but when the Gladholders then use a "telescope" to see humans on Venus, the



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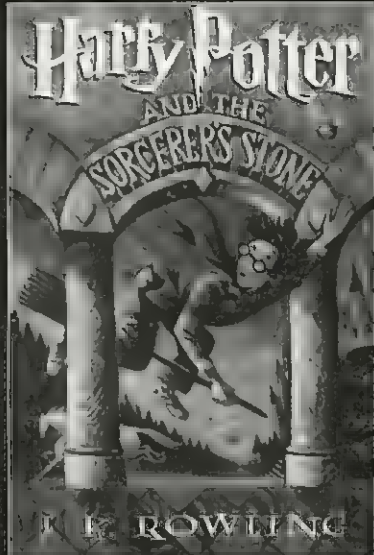
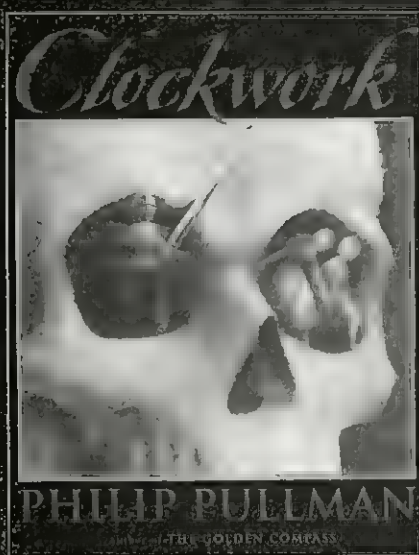
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whole thing becomes ridiculous. John's main profession on Ganymede is making shoes by hand in a society supposedly more mechanized than ours (they all wear powerful "zeespec" computers as eyeglasses), and in a low-gravity, indoor society where shoes are a strangely archaic concept. One of John's main jobs on the ship is to manually monitor prioritization of computer processing, to avoid system crashes, another laughably archaic concept. John (admittedly not a scientist) uses his cellular automata programs to guess what the Mycora might be capable of despite knowing that his rules have no basis in reality. McCarthy mixes concepts and situations both ludicrous and sublime indiscriminately throughout the novel.

The greatest failing in *Bloom*, however, are not these annoying inconsistencies, but an almost total lack of depth of characterization. None of the characters is real or sympathetic. None is predictable. One of the crew members goes (in a few chapters in the middle of the book) from hating John to having sex with him to trying to kill him, and it's hard to understand the motivation for any of it. A good hard-SF thriller needs realistic characters that the reader can care about, or at least bright and competent characters that the reader can admire, but *Bloom* has neither to any real extent. And it's too bad, because based just on the strength of the overall concept and plot, *Bloom* could have been one of the year's best SF novels.

D. Douglas Fratz

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Legends, edited by Robert Silverberg. Tor Books, hardcover, 703 pages, 27.95.

In *Legends*, Robert Silverberg has brought together 11 of the most currently famous and best-selling authors in science fiction and fantasy, each telling a new story set in his or her own chosen milieu. It's a great idea in theory, and couldn't have been easy to manage, yet manage he has. Let's see if the fox was worth the chase.

Stephen King leads with a new tale of Roland of Gilead and his quest for the Dark Tower. In "Little Sisters of Eluria," Roland arrives at a dead town on a dying horse. Eluria is empty, save for one dead body and an oddly marked dog. Or rather, seemingly empty. After an attack by mutant monsters, Roland awakens to find himself in the tender care of the Little Sisters of Eluria, an order of hospitaliers—such care as would soon make the tender mercies of the monsters look good by comparison. King can always work the horror element, that's a given, but sometimes I don't think he gets enough credit for the range he shows, with more or less mainstream work like "The Body" or his idiosyncratic take on a fantasy world with *The Dark Tower* stories. Those tired of generic fantasy, who sometimes think that's all fantasy is or can be, should really give this series a try.

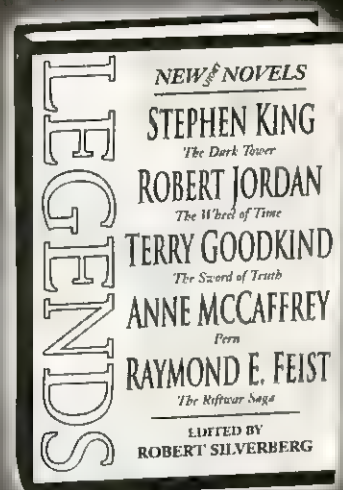
In "The Sea and Little Fishes," Terry Pratchett spins a new *Discworld* story featuring two of my favorite characters, Granny Weather-

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wax and Nanny Ogg. The two witches do battle with that most dreaded of modern monsters, the committee. Granny Weatherwax especially gives a fine example of the old kill with kindness stratagem, and proves once again that sometimes all that's required to hang your enemies is to hand them the rope.

Orson Scott Card gives a tale from his *Alvin Maker* series, "Grinning Man." In this alternate America, Alvin and his companion Arthur Stuart meet with a Davy Crockett who is not quite the same as our history and legend remembers him. What follows is equal parts tall tale and morality play, and a lot of fun.

Robert Silverberg's own contribution to the book is "The Seventh Shrine," a story of the giant world Majipoor introduced in *Lord Valentine's Castle*. Lord Valentine himself is here, now as ruler of the entire planet with dreams of reconciling the shapeshifting indigenous peoples of Majipoor, the Piurivar, with the conquering human colonists. To that end, he has ordered the excavation and restoration of the ancient native capital, long cursed and abandoned. When a Piurivar archeologist is ritualistically murdered on site, it is up to Valentine himself to solve the mystery and save this chance for reconciliation.

Ursula K. Le Guin returns to *Earthsea* for "Dragonfly." To say anything at all about it is to reveal too much. I will say here that she touches again on some themes last raised in *Tehanu*, yet leaves just enough questions unanswered to make this reader wonder if

there is perhaps another *Earthsea* book in the works, despite *Tehanu's* billing as the last book of *Earthsea*. I don't know. I'm just selfish enough to hope so.

Tad Williams contributes a story from his series that began with *The Dragonbone Chair*. "The Burning Man" tells the story of Breda, a girl from the fisherfolk of Kingslake, and how she came to be the stepdaughter of the man called The Heron King. Or rather it's about the struggle of faith versus proof, love versus duty, and love versus love. It addresses all this and still feels more like a vignette than a complete story, despite its length and timespan from the youth of the character to her advanced old age. There's clearly a good deal more to the story than just Breda's part, which is a greater virtue in a novel. For a taste of Williams' world, however, it succeeds pretty well.

One of my personal favorites in *Legends* is George R. R. Martin's *Seven Kingdom's* tale, "The Hedge Knight." Dunk, the poor squire of a poor knight, tries to transform himself after his master's death into Sir Duncan the Tall through the means of an upcoming tourney. Seems simple enough. Risk his few belongings on one pass of the lance, gain fame or lose all. Yet in this simple act "Ser Dunk" sets great changes in motion, many bad, perhaps some good, and no way to know which is which. Or as Dunk's old master used to say every evening, "I wonder what tomorrow will bring?" He didn't know, and could only learn by facing tomorrow. That is what Dunk will

do, too. Champion or "knight of the hedges," that's all any of us can do.

"Runner of Pern," by Anne McCaffrey, like some others in this book, is a vignette in everything save length. It's about Tenna, a young runner from a long line of message runners who carry documents and letters around the holds and weyrs of Pern. Again, there's more incident and scene setting here than story arc but there are dragons and more than a little romance. Fans of Pern should enjoy this.

Raymond E. Feist's *Riftwar* story, "The Wood Boy," is the shortest piece in the book, but has much less of the feel of incident, and more that of a complete story. Feist is less concerned with background here and sketches rather than paints with fine detail; even so a knowledge of the background is useful but not necessary.

We follow Dirk the Wood Boy, a servant in an estate overrun by the invading Tsurani as he learns to cope with life under occupation. When his Lord is murdered it is up to Dirk to take revenge, though not as he might have expected, on the Tsurani. Leave it to human beings to make something as horrible as war a little worse, given the chance. It's the small, unexpected kindnesses that maintain hope; in Dirk's case he receives one that he can never know about and yet may make all the difference.

Pieces by Terry Goodkind and Robert Jordan complete the set. There are 11 stories in all, several from authors not known for their

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brevity. Not all the writers are comfortable at shorter lengths, and it shows. The Martin, King, Pratchett, and Silverberg probably work best on a pure story level, but fans of all these authors' universes will enjoy the homecoming. Those looking for introductions to series they haven't yet tried should find what they're looking for here.

Richard Parks

The Golden Globe, by John Varley.

Berkely Ace, hardcover, 425 pages, \$22.95.

Sometimes in order to really appreciate an author and his book, to truly understand his means and ends, you have to peel back the layers of influence. It's often not enough to identify an author's primary artistic heroes and models; you have to dig deeper. Who did his models model themselves on?

John Varley loves Robert Heinlein. This is no secret. Since Varley's first appearance ("Picnic on Nearside" in 1974), the arrow-pierced, heart-shaped graffiti containing the initials JHV and RAH have been engraved into every one of Varley's books. Heir to what critic John Clute has called "the compulsive narrative hooks employed by Heinlein in his narrative prime," Varley has delivered some of SF's most palpable futures, full of memorable, shiny characters and wonder-stimulating speculations. Blending satire, sentiment, and cold-blooded ethical calculus, Varley shows mankind persisting and flourishing even when booted off their homeworld.

But wait: from whom did *Heinlein* derive much of his characteristic worldview, manner, and tone? Why none other than Mark Twain, that scabrous, cigar-smoking Sage of Hartford. Twain is the hidden seam of precious ore that many an SF writer has secretly mined.)

In his latest book, *The Golden Globe*, Varley has gone even more directly to the works of the white-suited Mississippian. This tale of an adventure-packed, cross-Solar-System journey made by one Kenneth "Sparky" Valentine—thespian, rascal, and all-around figure of freedom—is a deep character study that encompasses the fall, exile, and redemption of the protagonist. By making Sparky Valentine a blend of wise-child Huck and two of the more intriguing of Twain's lowlifes, the common known as the Duke and the Dauphin, Varley achieves new angles of interest and new insights into his futuristic society. And returning to a higher level of influence, of course, this book recalls Heinlein's *Double Star* (1956), another SF tale of an actor's misadventures.

The Golden Globe takes place in Varley's famed "Eight Worlds" universe. Prior to 1992, this scenario had been explored most intensely in *The Ophiuchi Hotline* (1977). Then came *Steel Beach*, in which Varley returned vigorously to his timeline, with warnings in an author's afterword about not demanding foolish consistencies with older works. A first-person account of The Big Glitch by Hildy Johnson—reporter for one of Luna's news media at a time some 200 years after mankind was expelled from Earth by the

BOOKS TO WATCH FOR

The Transparent Society, by David Brin (Addison Wesley). The multiple Hugo and Nebula Award-winning author of *The Postman* and *Startide Rising* shows his philosophical side with this nonfiction treatise on the way things ought to be.

Treks Not Taken, by Stephen R. Boyett (Harper Perennial). This amusing spoof volume features 20 *Trek* "might-have-beens," including J. D. Salinger's "The Crusher in the Rye," Ayn Rand's "Fandom Shrugged," and Joseph Heller's "Trek 22"—*Not!*

The Melbourne University Press Encyclopedia of Australian Science Fiction, edited by Paul Collins, Sean McMullen, and Steven Paulson (MUP). The first volume to delineate the contributions of Australia's SF, fantasy, and horror scribes such as A. Bertram Chandler and George Turner.

Convergent Series, by Charles Sheffield (Baen). An ancient race left behind a huge and supremely powerful artifact called Paradox, and Hans Rebka is determined to solve its mysteries. This omnibus edition unites Sheffield's novels *Summertide* and *Divergence*, revised for this edition.



Babylon 5: Dark Genesis: The Birth of the Psi Corps, by J. Gregory Keyes (Del Rey). As Straczynski's masterpiece winds down, his novel franchise continues to heat up. Discover how the Psi Corps came to be.

Cold Tomorrows, by Bruce Boston (Gothic Press). The ever-prolific

Boston, a frequent contributor of short stories and poetry to these pages, brings forth yet another collection of dazzling science fiction poetry.

The Sci-Fi Channel Encyclopedia of TV Science Fiction, by Roger Fulton and John Betancourt (Warner Aspect). If it appeared on television, and

it's SF, it's in here. Next time you're debating the name of that hard-to-remember guest star, this will solve the argument.

Where Late the Sweet Birds Sang, by Kate Wilhelm (Tor Orb). Although she has since become known primarily for her elegant mystery novels, SF fans remember most her celebrated award-winning science fiction. Back in print at last.



mysterious Invaders—*Beach* focused on Hildy's suicidal unease upon reaching age 100, and the similar insane impulses in Luna's omnipotent Central Computer. (Of course, all this was in part a sly take on Heinlein's *The Moon Is a Harsh Mistress* [1966].) The real-time portion of *Globe* takes place a few years after the ending of *Beach* and manages to reintroduce Hildy herself in a crucial role. Yet unfamiliarity with either *Beach* or earlier "Eight Worlds" tales will not detract from your enjoyment of *Globe*.

When we first meet the witty, egotistical, yet lovable Sparky, he too has just turned 100—middle-aged in this era—and is undergoing his own existential crisis. His first 30 years of life were unique by any standards. The ultratalented Sparky was a prodigy, a sacred monster molded by his domineeringly similar father. Sparky played a child television star, kept artificially forever-young and famous across the inhabited System. His next 70 years consisted of fleeing that legacy, which ended traumatically, living a wanderer's chancy life, sustaining himself by various acting stints and illegal scams. Now he must return to Luna and confront his past. Because our story starts out beyond Pluto, this long journey allows Varley to touch down on various colorful waystations in his milieu,

showing us such wonders as the System's biggest artifact, Oberon II, and the warped ex-prison colony of Charon, where Sparky acquires a deadly nemesis who dogs him all the way to Luna.

Along the way, Varley employs diverting flashbacks to disclose Sparky's intriguing past. The running thread of Shakespeare's plays as a microcosm of life is another well-executed motif: Sparky claims that an actor's career begins with playing Romeo and ends with playing Lear, a situation which the book itself exactly replicates.

My one quibble with *Globe* would have to be its final few pages. After Sparky's long-standing personal tribulations are neatly and cleverly wrapped up, he instantly becomes a mover and shaker on a cosmic level at odds with his devil-may-care vagabondage. True, he's acting along lines of self-preservation, and also true, he used to be a fat cat for the first 30 years of his life. But it's a bit of a letdown to see a charming hobo, suddenly rich, issuing buy and sell orders like a bloated plutocrat.

But Varley clearly wanted to open his series to broader vistas—Sparky and Hildy are linked up and outward bound by the novel's end—and one can hardly fault that. Rather, I eagerly await the next raft down the river of stars.

Paul Di Filippo

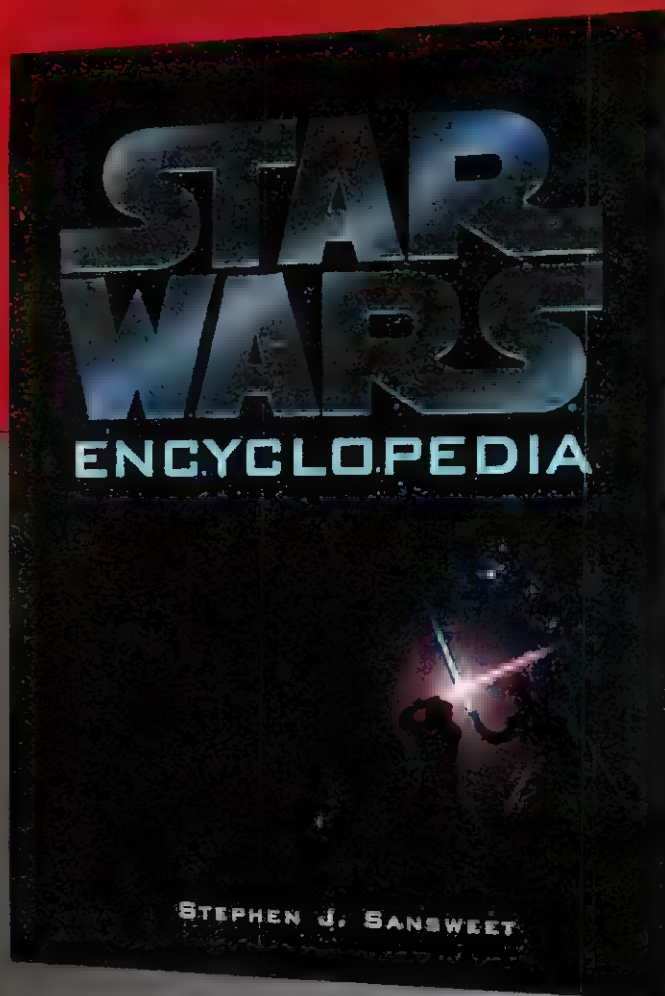
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In the end, Luke surrendered himself to Vader's troops on the forest moon of Endor, where the Emperor had set an elaborate trap for the Alliance, centered around the second Death Star.

Brought before the Emperor and Vader, Luke appeared to his father, trying to reach the bit of Anakin he was sure remained inside. Palpatine goaded the boy about the fate of his friends until Luke attacked. Vader defended the Emperor and he and Luke were locked in mortal combat. Then, gaining control of his anger, Luke stopped fighting. But a probing Vader discovered the secret of Luke's twin sister, Leia. Luke lost control and attacked Vader again, finally beating him down and chopping off his hand with his lightsaber.

Luke then confronted the Emperor, who attacked him with blast after blast of blue force lightning. He prepared to kill young Skywalker. Suddenly, Vader grabbed the Emperor, lifted him into the air, and threw him down the shaft of the battle station's power core. Vader knew he was dying and asked his son to remove his helmet so he could look at Luke with his own eyes for the first—and last—time. Luke, he said with his final breath, was right. He still did have some good buried deep inside his dark spirit.

Anakin's worn-out body then became one with the Force. Luke took his mask and black vestments to the forest moon of Endor and buried them on a pyre. And then, before his eyes, appeared a vision: Obi-Wan Kenobi, Jedi Master Yoda, and Anakin Skywalker, all luminous beings in the light side of the Force. *see also, p. 111*

Vagabond Concept A sweet couple it was loved by Leia Organa Solo and occasionally served in the New Republic Senate chambers. *see p. 101*

Valkyrie A male Quarren member of Rogue Squadron, he has a predilection for clinging to the past. Although Nton Vakil does tend to anticipate the worst in any situation, he does not whine. Instead he accepts things with a good-natured fatalism that forms the basis of his sense of humor. He loves his wings with a passion and takes great delight in defending them. Vakil is unfailingly brave. As from fearless, he embraces his fears and pushes on through them, but he shies away from praise. *see p. 101*

Valarian, Lady A large, heavy-boned, her body covered with long golden and white fur, she is an imposing Wiphid crime lord. Lady Valarian's most prominent feature are her large tusks, which jut out of her lower jaw. She paints them and often wears a gold ring in the left one. She constantly changes the tint of her mane, which curls down the sides of her long-mottled face.

Valarian, the daughter of two gangsters, comes from the bitterly cold planet Toca. Her own criminal career started when she was very young. She eventually found her way to Tatooine, where she brought a battered old cargo hauler called *The Lucky Despot*, which had been refitted as a luxury barge and then abandoned.

Tatooine's crime lord, Jabba the Hutt, was pleased with the competition that he knew she would bring, but they eventually reached a truce even though they continued to spy on each other. She continually plotted to kill or otherwise dispose of the Hutt, although she was cautious, fearing retribution.

Valarian employs a large network of gambling cheats, smugglers, and other criminals to carry out her various schemes. Her wedding day ended in disaster when her mate agreed to accept a job from Jabba to find Han Solo and she experienced her unhappiness in the most murderous of terms. After Princess Leia Organa and Luke Skywalker polished off Jabba, Valarian set out to take over much of his empire. *see pp. 101, 101-102*

Valdez, Shamen A charismatic leader of the Rebel Alliance, he was also an experienced evacuation officer. Shamen Valdez played a major role in the near-miraculous evacuation of the Alliance's Echo Base on the planet Hoth during a withering attack by the Empire. Also a poet and musician, Valdez had been well-trained to evacuate Rebel installations with maximum efficiency. *see p. 101*

Valiant This Alderaanian *Thermax*-class War Cruiser was one of three ships modified with robotic controls.



Lady Valarian



Darth Vader

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featured in a nine-card subset consisting of three Personal Log cards, three Reflection cards, one Captain's card, one Crew Manifest card, and one Alien Encounter card. "All of the major story arcs and subplots will still be covered, but in a different, more interesting way." In addition, the base set will include the bonus sets Alien Technology, Make-up with Michael Westmore—and *Voyager's* resident Borg Seven of Nine will have her own nine card expose. (Cleverly, the seventh card in this nine card set contains an extra special surprise.) Some lucky fans will even have a chance to win a complete set of the autographed cards. For further information, call 800-424-6735.



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AUDIO

The titanic rivalry of King Kong versus Godzilla has exploded yet again, but this time instead of a battle to the death it's a battle of the bands! Some of the greatest monster music ever created, spanning four decades of cinematic mayhem, is now jam-packed on Silva America's latest CD offering, *The Monster Movie Music Album*. Akira Ifukube—who has become as synonymous with Godzilla as John Barry has been with James Bond—launches the disc with the haunting theme from *Godzilla*, *King of the Monsters*, and is followed by *King Kong* numbers from Max Steiner (*King Kong*, 1933), John Barry (*King Kong*, 1976) and John Scott (*King Kong Lives*). To ensure that other monstrous beast don't get jealous, also included are various tracks from *Mysterious Island*, scored by the

talented Bernard Herrmann, as well as an assortment of Mario Nascimbene Stone-Age suites from the likes of *One Million Years, B.C.*, *When Dinosaurs Ruled the Earth* and *Creatures the World Forgot*. Wrapping up the tracks is the man who made *Titanic* sing, James Horner, who weighs in with his themes from *The Land Before Time* and *We're Back: A*

Dinosaur History. *The Monster Movie Music Album* is currently in stores, or can be purchased by calling 800-757-7515. Visit Silva America's website at www.silvascreen.com.

The Sound of MONSTERS

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Do you count yourself as being part of the elite class who claims complete knowledge of all things *Star Wars*? Challenge all that you know, or think you know, against Hasbro's *Trivial Pursuit: Star Wars Classic Trilogy Collector's Edition*, which combines one of the greatest films of all time with one of the greatest games of all time. Gameplay is similar to the familiar classic *Pursuit* but with the twist of George Lucas' ancient universe. The categories you may choose from are "Characters," "Weapons & Vehicles," "History," "Geography," "Droids, Creatures & Aliens," and "Wild Card." Do you know what planet Anchorhead is found on? (Tatooine.) Or how many engines power a Y-wing fighter? (Two.) How many rats were

seen crawling in Jabba the Hutt's dungeon window? (Three.) And what two pilots were Luke's wingmates during his Death Star trench run? (Wedge Antilles and Biggs Darklighter.) And SF fans can forget yesterday's boring, old dice. In this futuristic version, players press the head of a miniature R2-D2, who squeaks and beeps and gives the number of spaces you should move on a digital readout on his chest. The four playing pieces are made of quality pewter shaped in the likenesses of Luke, Leia, Han, and Darth Vader. For more information use The Force (or, if you don't happen to be a Jedi Knight, the web browser of your choice) to visit www.trivialpursuit.com or www.hasbro.com.



- Who was the first character willing to trust Lando after Lando's betrayal? (C-3PO)
- What did Lando Calrissian promise the Falcon wouldn't receive while in his care? (A scratch)
- What was Lando Calrissian's callsign during the second Death Star battle? (Gold Leader)
- What planet did the Rebel fleet gather at, prior to the second Death Star battle? (Sullust)
- What Rebel leader said, "It's a trap," during the second Death Star battle? (Admiral Ackbar)
- Who summed up Lando's piloting skills as "fair"? (Han Solo)



NEW ON VIDEO

Nostalgia seems to have captured the day, as a trip to your local video store will tell:

Lost in Space: The camp '60s success story has been transformed into a tale of tomorrow's most dysfunctional family. William Hurt and Mimi Rogers star as the mom and dad of a future brood trying to find their way back home. Gary Oldman, having taken on Harrison Ford in *Air Force One*, plays yet another delightfully creepy villain. Also starring Matt (Friends) LeBlanc.

2001: A Space Odyssey: Thanks to DVD technology, a widescreen version of director Stanley Kubrick and writer Arthur C. Clarke's science fiction masterpiece has been made available on the 30th anniversary of its initial release. Extras include a press conference with Clarke, the original theatrical trailer, and a booklet containing trivia and behind-the-scenes photos.

The Avengers: For those with short memories, twelve episodes of the original British TV cult classic that inspired the current big screen reincarnation are being released to the home video market. Patrick McNee stars as John Steed and Diana Rigg heats up the screen as Emma Peel in these installments from 1967, the years that the series was first broadcast in color in the U.S. Includes the famous episodes "The Winged Avenger" and "Never, Never Say Die."

Species II: Sil, the voracious, coldhearted alien killer from *Species* has finally met her match. Natasha Henstridge, the beautiful but monstrous star of the first installment in this series, finds that astronaut Patrick Ross (Justin Lazard), just back from a mission to Mars, has also been infected with a spaceborne virus. Once the mating dance begins, the carnage ensues.

The Tribbles Gift Set: Actually, there's no trouble with tribbles at all, as the powers that be behind *Deep Space Nine* learned when they produced a follow-up episode to classic Trek's most beloved outings. *ST:DSN's* "Trials and Tribble-ations" sent the third *Trek* crew through a time warp and married new footage and old to delightful effect. This boxed set features a talking tribble that makes the classic tribble sounds, available only with this Gift set.



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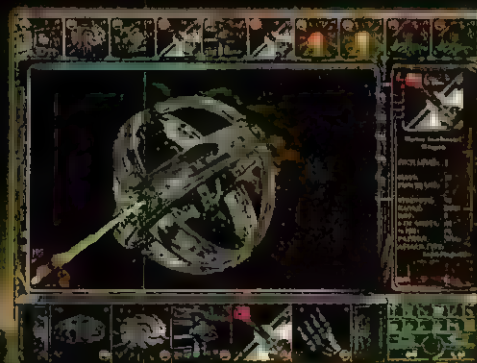


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By Melissa J. Perenson

As *The X-Files* moves to L.A., the series' stars consider season six.



ABOVE: Fox Mulder (David Duchovny) would find the reasons behind *The X-Files'* move to Los Angeles an easily solvable mystery.

WHERE DOES A TELEVISION SERIES GO WHEN it's coming off of a summer that saw the release of a successful feature film, the relocation of the production, and a whopping 16 Emmy Award nominations? Well, when you're *The X-Files*, you keep on doing what you do best: Throwing curve balls to your audience while striving to reinvent yourself and raise the creative bar even higher.

The X-Files is due for a shake-up. After all, the series is entering its sixth season, a time in any show's life span during which lethargy can set in and stories can become stale. But the series' new Los Angeles home base, coupled with the events of the *The X-Files* movie, which answered some long-standing questions as well as raised a host of new ones, have ensured that *The X-Files* is in no danger of succumbing to the usual perils that afflict long-running series.

The movie may have focused on the black oil, but the coming season will explore the conflicting alien factions introduced in such episodes as "Patient X/The Red and the Black." "We'll see a lot more of that," promises series creator and executive producer Chris Carter. "Now that we've set it up with the black oil, we can explore that."

Meanwhile, expect intrepid FBI Agents Mulder (David Duchovny) and Scully (Gillian Anderson) to come to terms with their experiences in Antarctica, and to convince others of the fantastical events they witnessed there. "It will have to be dealt with as the series goes forward. But that's the fun of the series. It's going to be getting people to believe this is, in fact, going to happen," Carter offers. "And Mulder and Scully still may have been told some lies. We still don't know. We'll play with this

and continue on with that conspiracy." A central component of the mythology thus far, Scully's abduction back in season two and the consequences of that abduction, will be addressed in the coming year, as will the questions surrounding what really happened to Mulder's sister, Samantha.

Originally, the truth about Samantha had been addressed in the movie's limousine scene with Mulder and Well-Manicured Man (John Neville), but it quickly became lost within the context of the film. "We realized that there was a lot of information to digest in that part of the movie, and it ended up coming out of the blue in a way that made the scene less easy to understand," explains Carter. "So we decided to take that out and play with it in season six."

Even though it was Scully's evidence that convinced the FBI to reopen the X-Files, early word about the coming season is that Mulder and Scully are off the X-Files and have a new boss, although their former superior, Skinner (Mitch Pileggi), will continue to help them off the record. Two characters introduced in the fifth season, Agents Spender (Chris Owens) and

Fowley (Mimi Rogers), have been assigned to the X-Files instead. Picking up on the story line from the fifth season's finale, the first episode jumps right in by revisiting Gibson, the chess-playing child prodigy whose ability to tap his brain's God module could hold the key to explaining the nature of paranormal phenomena.

That's not all that's revisited. "We've established Mimi Rogers as an old flame coming in, so I think that [audiences] are going to have to accept it, [allow us] to play that out," Carter says, presumably well aware that he's broaching dangerous territory in the eyes of both those who wish to see Mulder and Scully move their relationship to the next level, and those who wish to avoid seeing the series deteriorate into a soap opera.

The direction of Mulder and Scully's relationship is a topic of hot debate. "From day one, we've been talking about the fact that it just wouldn't work in the series," remarks Anderson, "but I'm curious as to how, after the movie and the extra zing that's in the film, and whether it should or shouldn't influence how we are with each other in the series. If it does, how will it influence the work that we do? I don't know."

Duchovny is equally unsure of what's right for the show. "It's hard to say what would ruin the show, or what would make it good, without actually doing it. But [a relationship] could be interesting. If we had someone come in who wrote beautifully in that direction I'm sure it would work, but I don't see that happening."

Although *The X-Files* will always be defined by its eerie look, that look is bound to change now that the show has moved from dark and atmospheric Vancouver to bright and sunny Los Angeles. "It's obvious it will change,"

3:06 PM
head out for anniversary
gift for girlfriend

3:21 PM
run into fellow player with Bajoran
rescue deck

7:22 PM
resign yourself to celibate lifestyle



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affirms Carter. "I'll have a new crew. I'll have a new environment to shoot in. We'll have bright sunlight in the daytime, although if it's anything like last year, it will be just like Vancouver; the weather in Los Angeles was so bad last year."

Shooting in LA's environs presents a new creative challenge to the production, and not just to avoid inadvertently getting palm trees into scenes that are supposed to be set in Maine. "It's going to be different because

Scully's point of view. Without a Scully point of view, you've got no point/counterpoint. So it's important that our science be accurate, and it's important that the science be good, because it provides the leaping-off point for the rest of the show," maintains Carter.

When conceiving the series' pivotal mythology episodes, Carter knows where he's ending up, but not necessarily how he's going to get there. "I have a big general idea of what

days. Everyone knows about the human genome project now that's going on; it's in the paper every day. While the dialogue [of the show] is sophisticated, it also never attempts to confuse or baffle." Well, perhaps not consciously, at any rate.

Another unusual thing about *The X-Files* is the show's application of a cinematic approach to making television. "We try to tell our stories visually and we use a lot of movie conventions in the telling of our stories. It just feels like a movie most weeks, anyway. And that's our goal," says Spotnitz.

"Now, after having done the movie, I know whatever you do in television isn't quite cinematic because making a movie is a much more elaborate process than making a television show," admits Carter. "But, we tell the stories as if they were little movies, and we take a big-screen approach on the small screen in the way we tell our stories and the way the shows are directed, certainly, and in the way the stories are very plot-driven. They are good, round mysteries, and a lot of television gets by on character development ensembles, a-b-c-d-e-f-g stories. *The X-Files* tells one good, strong story every episode, and I think that's much more of a movie approach."

Even the series' recurring, mysteriously named characters have come to life. "After working with so many scripts and telling so many stories with these ancillary characters with names, if there's more than three of them, you've got your work set out for you just remembering who these people are," explains Bowman of how the nomenclature system developed. "So Chris's approach was: He's just a guy smoking a cigarette, that's all he is. So, he's Cigarette Smoking Man. When CSM started the series, he was leaning against a filing cabinet listening to a conversation and not reacting at all. He was a paper figure. Then, you start to learn a little more about him. It's funny because on the set, we're always making up new ones. And we've been through Plain Clothes Man, Red Hair Man, and Black Tie Man, but it makes it easy for identification."

The X-Files' real ace in the hole, however, lies in the chemistry between leads Duchovny and Anderson. Together, Duchovny and Anderson have taken the art of subtlety to new heights. Certainly, these two roles, like the cases the duo investigate, have proven to be anything but ordinary over the years.

"It's incredibly gratifying," says Anderson of what's it's been like to play Dana Scully. "It would have been harder to stick with it were I not playing such an intelligent, such an interesting and multidimensional character as Scully is. When I read the pilot, I was struck how unlike a TV script it was and, also, by how complicated and interesting the relationship was between Mulder and Scully. I think that more than anything," she continues, "[it was] her intelligence and her strength in standing up to Mulder and feeling confident about expressing her beliefs in

Continued on page 97



Scully (Gillian Anderson) and Mulder (David Duchovny) are going Hollywood.

you're not going to get to the diffuse light every day, you're going to get hard sun and you're going to get LA sun," explains Rob Bowman, who's directed over 25 episodes as well as the movie. "That's different from what we're used to."

Look to the bright lighting seen in the film for an example of what *The X-Files* may look like in the future. "[The movie] certainly was harder because day exterior in the Mojave desert is about as hot a light as you can get and about as far from Vancouver as there is," says Bowman. "But the movie couldn't all of a sudden look like another show. I had to make it look like *The X-Files*."

Bowman has a similarly positive spin on the impact the move will have on the series. "I think it might be farewell to an old friend and hello to a new one. We'll find a new look that takes the old one and goes a little further with it," he says confidently. "That's what we must do, because we certainly can't go backward."

Adds Carter, "We'll just use the new environment to our advantage. Just make a virtue out of the problem, which is that we're now shooting in sort of a concrete jungle. [We'll] tell stories that we wouldn't have been able to tell in Vancouver, so I think it's going to be an interesting opportunity."

Carter draws on reality for many of the ideas for the series. "People say, 'Where do you get all these wild ideas?' Many of them come directly from science. The show needs a scientific foundation, because that is

the conspiracy means and what the conspiracy is," he explains, "but as we go forward, we find new little things to do to add to it. And so that's the fun of it. If you set everything down too clearly for yourself in the beginning, I think you end up without the sort of wonderful discovery of new things to add in. So, I think flexibility is important in this kind of storytelling. Also the faith that you're going to make the right choices as you go forward."

"We don't have ending points. Sometimes we don't know, and that's part of the excitement of the show to us, too, [as writers]," contributes Frank Spotnitz, co-executive producer on the series. "Chris is very specific on where he wants the show to be and he's not willing to say, 'Okay, that's close enough to what I had in mind.' He won't do that."

The series' intelligent, and at times convoluted and contradictory, stories often subscribe to the tenet that less is more. "I think far more often that approach is appreciated by the audience. That's one of the reasons why the show is so successful," reasons Spotnitz. "You're left to put the pieces together yourself in order to understand the conspiracy. It's a jigsaw puzzle, and we keep adding new pieces and taking pieces away. There's an awful lot of questions that aren't resolved and that's what makes the show interesting."

"You know, you make a mistake in thinking that the audience is not as smart as you are. I think the audience is very smart," elaborates Carter. "I think the audience is very sophisticated. We have so much information these

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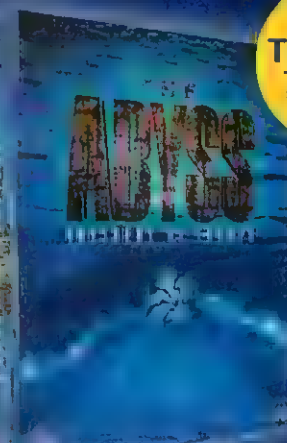
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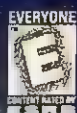
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At the end of the millennium, look back on how the space program was born.



ABOVE: The future that was promised to us by NASA. BELOW: The past that helped bring us into space—a popular science magazine of the late '30s.

THE CONQUEST OF SPACE, THOUGH DISTANT IN memories, is really only a blink of an eye away. Sometimes it seems as if rather than living in the Space Age, we are instead living in the Post-Space Age. That, to us, is shameful. To remind readers of what it was like before we got into space, we sat down aided and abetted by fellow questioner Charles Sheffield, with one of the pioneers of rocketry.

Frederick C. Durant III has been active professionally in the development of space flight for half a century. A WWII naval aviator and test pilot, he was the Director of Engineering of the Naval Air Rocket Test Station in Dover, New Jersey. Mr. Durant is a past president of the American Rocket Society and the International Astronautical Federation. He is the author of articles on space exploration for *Encyclopedia Britannica*, and was the Assistant Director and Head, Astronautics Department, at the National Air and Space Museum, where he developed the collection of rocket and spacecraft artifacts and supervised their exhibition in the United States and abroad.

SF AGE: Describe for us the early days—the time before there was a space program.

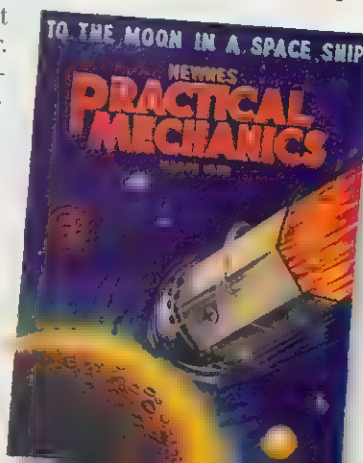
DURANT: That might be called the Dark Ages, when there were few true believers! After the war, I joined Bell Aircraft in the rocket group in the spring of '47. Late that year, in October, Chuck Yeager made the first supersonic flight in the Bell X-1 aircraft. The X-1 was powered by liquid propellant rocket engines. It was pretty exciting! When you get your first baptism of the sound of a rocket motor—a continuous explosive sound blasting your ears and vibrating your chest—you never forget it. It was an enormous display of raw force and energy. At this period at Bell, we were receiving dozens of captured German documents. There were translated Intelligence documents, and many reports in German on rockets and missiles. Such reports were sent to all of the missile contractors and research establishments. The attitude of many engineers was, "That's the way the Krauts did these things, but we'll do it better." There were at least eight or 10 different rocket-powered missiles that the Germans had at various stages of development at war's end. I was intrigued.

And at this same time, one of the chaps was a member of the British Interplanetary Society. I saw their *BIS Journal*, and it was talking about Earth satellites! The success of the V-2, 200-mile ballistic missile pointed the way to much larger rockets than we had in the States. The V-2 engines delivered 46,000-pounds thrust, much larger than any liquid propellant rocket engines in the U.S. Rocket motor in the United States at that time. The Navy Viking rocket being tested at White Sands had 20,000-pounds thrust, less than half of the V-2 thrust. The key to satellite flight is sufficient velocity; and the velocity of the V2 was greater than any velocity of a rocket-powered vehicle to that time; faster than a bullet. With a little extrapolation—make it lighter, make it larger, increase thrust, more propellants—bingo, you've got satellite flight.

SF AGE: It seemed obvious to you and to members of the British Interplanetary Society, but what was the general perception? Did the public think it was loony?

DURANT: The American Rocket Society wrote about these things, but more guardedly. I joined the American Rocket Society and the BIS in 1948. The general attitude was that few professional people would talk about it for

publication. I'd say from '48 to '50, in that period, there were few engineers or scientists in the country who would want to have their name associated with the subject. But clearly there were a clutch of people who were really keen about it. By '48 I was back on active duty again. Cmdr. Bob Truax was in the Bureau of Aeronautics and conned me into returning to active duty because Bu Aer was establishing the naval rocket test station in New Jersey. I was a Lieutenant Commander. We were doing some



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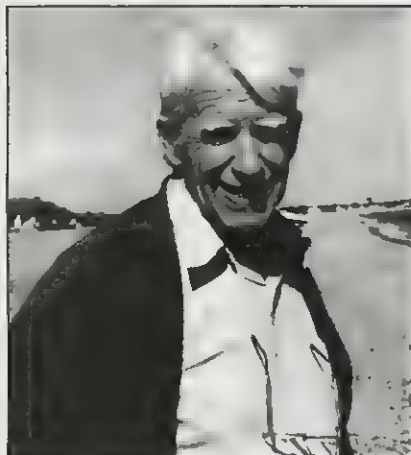
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Gordon Steele of Virginia, pictured above, is the latest Grand Prize Winner in The National Library of Poetry's North American Open Amateur Poetry Contest. As the big winner, he was awarded \$1,000.00 in cash.

anthologies. Previous anthologies published by the organization have included *On the Threshold of a Dream*, *Days of Future's Past*, *Of Diamonds and Rust*, and *Moments More to Go*, among others.

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rocket development work ourselves, and providing test facilities for others.

I joined the American Rocket Society, and the next year elected a director—there were so few enthusiasts! ARS board meetings were held in New York once a month, with Ed Pen-dray, an ARS founder and former president; Chuck Chillson, who ran the rocket work at Curtiss-Wright in those days in Caldwell, New Jersey; and Bill Gore of Aerojet-General. The ARS was slowly gathering attention at annual meetings. In 1951, the British Interplanetary Society and the German Rocket Society were prime movers in organizing an International Astronautical Federation—rocket and space flight societies from around the world. A formative meeting was scheduled in London. Wernher von Braun had a paper, I had heard, but he was not yet a citizen and couldn't leave the country. He was working on military rockets at Huntsville, Alabama for the Army. We met, and meshed enthusiasms. He decided he'd like me to present his paper. I said I'd be delighted. So I went to London, and that's where I met Arthur Clarke, Hermann Oberth, Eugen Saenger, and many other pioneers of rocketry. The attendees not only had the same enthusiasm and excitement about the potential for satellites and space flight, but were generally more sophisticated in appreciation and in understanding the technical problems than we were in the U.S. Clarke had already published in October 1945 the seminal concept of the use of three equatorially-placed satellites for global communications!

SF AGE: Was the perception that space travel would be the province of governments or of private industry? What were people thinking at the time?

DURANT: Clearly, the potential for individual backyard inventors didn't exist. You couldn't have the Wright Brothers again, because big bucks were required. We knew generally how to build large rockets. It was recognized by engineers to be feasible. It was not a matter of whether it was possible, but how do you solve the engineering problems of aerodynamics, of high temperature heat transfer, reliability, the handling of propellants, the ignition of propellants, seals, pumping systems or pressurization techniques. All of these are technical engineering problems. They are not scientific problems.

When Clarke wrote his '45 paper on global communications satellites, he of course imagined it would be done with manned space stations with vacuum tubes and they'd have to be maintained and replaced. Man would be required. Then came the transistor, eliminating vacuum tubes. The transistor shrank to the printed circuit boards. In any event, the USSR started the space race with Sputnik in 1957.

SF AGE: Speaking of the Russians, where does the Cold War play into it all as an impetus to move rocketry along?

DURANT: There were two leading countries building large rockets in the early '50s—the United States and the Soviet Union. At these international meetings we had about 15

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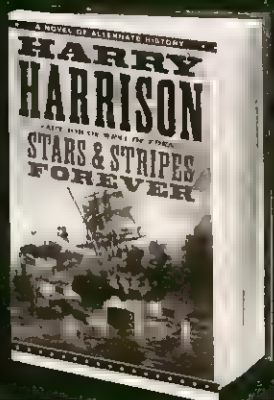
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countries with rocket societies that made up the International Astronomical Federation. The Russians, although they'd been invited through embassies to the different annual meetings at different capitals—London, Stuttgart, Zurich—they never accepted. But in 1955, the meeting was at Copenhagen, Denmark, and for the first time the Russians showed up. I happened to be the president of the IAF at that time. And at the same meeting, President Eisenhower announced that the United States was going to have a satellite program as part of the International Geophysical Year (1955-1957). That was when the space race really took off!

The IAF was a non-governmental organization. This was important, because the delegates were not national representatives. (Although of course, in a way they were, because there were military and individuals of other national organizations that came to these meetings.) At these meetings you had the excitement of meeting people of like minds from other countries on the subject of space flight and how we could achieve it. So the Russians now showed up for the first time. The United States had a program known as Vanguard. In 1954, von Braun and Cmdr. George Hoover of the Air Branch of the Office of Naval Research laid out the Orbiter program. The concept was to utilize a souped-up Redstone design, which was being modified for ballistic missile re-entry tests. Von Braun's team had conservatively ordered six vehicles. But they got the required data with two shots. This left four of these launch vehicles. With one additional stage, the velocity required for satellite flight could be achieved. This was how our first satellite was launched 40 years ago.

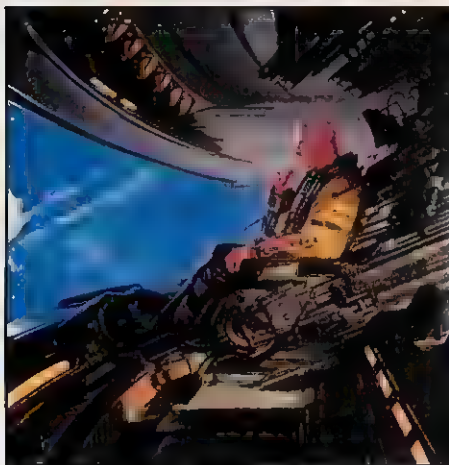
SF AGE: I was born in 1955, so to me, I was always alive when there was space flight, and now we've gone downhill. But you saw it grow, and we had a pseudo Golden Age. Where did we go wrong?

DURANT: Should I be blunt? First of all, there are some who have said, "Cancel the International Space Station. It's a boondoggle!" Billions have been spent on it, costs are increasing, and the schedule is slipping badly. It is not going to be a way station to the Moon or Mars or of great use for anything. It is in my view makework for the aerospace industry. Contracts have been craftily apportioned to all 50 States, to Japan, to Russia, and to the European Space Agency. And we've got 150 astronauts! Three shuttle launch vehicles and some 70 flights required to complete assembly! \$30-40 billion; tens of billions more to complete the station; billions more to operate around the clock, for a purpose that cannot be justified on the basis of these costs at this time!

SF AGE: So is the International Space Station giving us the illusion of movement with no actual movement?

DURANT: The movement is moving funds right out of the taxpayers' pocket. There are so many other programs that money can be spent on in space: much less spent and much

Continued on page 97



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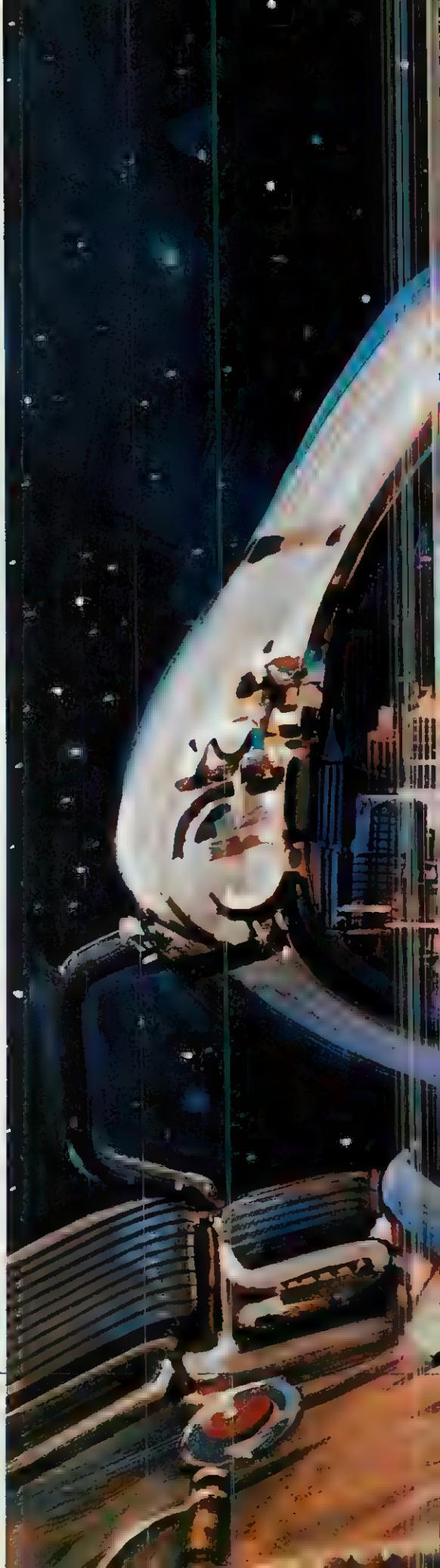
DOG

ELLEN GILLESPIE LIVED IN A WORLD OF her own. It looked much the way New York City would had it been wrapped around an asteroid and then turned inside out. Sitting on her balcony she could see a sky full of buildings that curved overhead and warped back down again somewhere behind her back. Ellen had lived in this world so long that it seemed absolutely normal to her.

She was happy there.

Each morning, she cabbied down to the Village for Turkish coffee and bagels with cream cheese and lox at Kuscaz's, a sidewalk café not far from the White Horse Saloon where Dylan Thomas had so famously drank himself to death. Lunch varied. It might be a salad *vinai-grette* with a glass of white wine at the MoMA or then again it might be a hot dog and a Coke bought from a vendor and eaten in Central Park at the foot of the Alice statue, where she could watch the little children launch their toy boats

BY MICHAEL SWANWICK
ILLUSTRATION BY JOHN BERKEY





Ellen's world was a small and private place, until the dog named Dog decided to butt in.

on the sailing pond. It depended entirely upon her mood. Suppers—unless she had a date—she ate at Lutèce.

It was a good life for a single woman with an income. Her apartment was large enough for the occasional dinner party, and even though she had designated one room as her library and set aside another for a darkroom, there was still space enough to work at home on days when she simply couldn't face going to the office. She loved everything about New York—its neverending variety, the sunshine that daily welled up from its many rivers, the fact that it never slept. Sometimes she took a close friend and the futon out onto the balcony at night and they would make love there, illuminated only by the splendor of a thousand neon signs and a million starry windows arching overhead.

She was in her study one day, going over photo proofs for a spread that *Vogue* had commissioned, when her girlfriend Stasi walked in—Ellen never bothered to lock her door—with an enormous sheep dog at her heels and announced that she was going away.

"Away? Away where?"

"Oh, you know." Stasi waved a hand vaguely. "Away."

"Well, when are you coming back?"

"Dear child." Stasi was a model and had once come within a whisper of supermodel-dom. The experience had left its mark on her diction. "I'm not coming back. None of us is. Ever."

A chill ran through Ellen. "What do you mean? You don't mean that."

"I just dropped by to ask if you'd take my dog." Stasi's hand was on the door now. "Don't let it beg at the table. Two meals a day is plenty."

"Wait!" Ellen cried. Stasi's eyes, when she looked back, were paler than pale—coldly, unblinkingly fixed upon death. It was terrifying. All Ellen's questions, objections, arguments, died on her tongue. "What's the dog's name?"

"Dog."

"Dog? Just Dog?"

"Dog."

"Why Dog?"

Stasi shrugged. "That's its name."

"Oh. Well, that makes sense. I guess."

And then she was gone.

Ellen closed the door. "Well, Dog, I guess it's just you and me, then. I'd better send out for some dog food. I wonder what you like to eat."

"Alpo will do fine," Dog said.

"You can talk!"

"Yes. I'm a talking dog." It walked to a corner, turned around three times, then lay down and promptly fell asleep.

Ellen was astonished, of course. But no more so than by the behavior of certain other roommates she had lived with in her time. New York was full of surprises. One either grew used to them or went back home to Idaho or New Jersey or wherever it was that one came from.

She called down to the concierge for a case of Alpo and, for the moment, that was that.

THERE SEEMED TO BE FEWER PEOPLE THAN USUAL OUT ON the street the next day. But Manhattan was a chaotic system, full of strange rhythms and unpredictable effects. You never knew what to expect.

Kuscazk's was almost empty, but Conrad said they were out of

her coffee anyway, so Ellen had to settle for a mocha latte. Dog lay by her feet, gnawing at a plate of sausages that Conrad had placed there at her direction. "You really lead a charmed existence," it remarked.

"You should talk," Ellen said a little nervously. She still wasn't sure how she felt about sharing her life—her secrets—with a talking dog. "I mean, there you are with your sausages and all the Alpo you could possibly want and somebody to see that you're properly groomed and you don't even have to hold down a job. Some people would say you've got it made."

"You wouldn't trade places with me, though."

"No, I guess not."

She paid with her American Express, left a cash tip, and took a cab to the office.

Rudolfo was waiting for her with a stack of black-and-white glossies he wanted her approval on. They were, as expected, technically brilliant, but—"Rudy, these are perverse! What happened to this woman's fingers? They're deformed. My God, all these people are missing things! Ears and legs and—this is supposed to be a fashion shoot, not a wallow in the gutter."

Rudolfo drew himself up haughtily. He was tall and thin and young and black; disdain looked good on him. "Perversity sells, *daarling*. Anyway, these are the best we can get. Every physically whole model in Manhattan has gone away."

She came to a photo of a woman with part of her skull missing and put a hand over it so she wouldn't have to see. "What about the agency in Soho? The one that made that big presentation last week."

"Out of business. I went there yesterday and it was gone. Vacated. *Tout perdu*. Models gone, the building torn down, and the street packed up into vans and shipped away."

"Now that's ridic—"

Dog, lying motionless on a sheepskin rug, suddenly said, "A singularity engine requires a black hole no more than a yard across of at least 0.00023 solar mass embedded within a curdled self-generated matrix of electromagnetic flux. It is capable of generating and maintaining a wave-front reality at a complexity of 86 million polygons per second. A single engine—"

"What," Ellen snapped, "are you talking about?"

Dog snorted, and twitched, and gracelessly stood—a process similar to watching the film of an avalanche being run backward. "I'm sorry, I must have been talking in my sleep."

"You were saying something about black holes and polygons. And numbers—there were a lot of numbers involved."

"Was I?"

"Excuse me," Rudolfo said. "What's with the mutt?"

"Its name is Dog. It can talk."

"Typical. Here I am, trying to hold a serious conversation about something important and you're off in Never-Never Land, talking to the animals as if you were Eliza Doolittle."

"Eliza Doolittle did not—oh, what's the point? Rudolfo, why are you being so *difficult* today?" She stopped. "Did you have a fight with Gregor?"

"Who?"

"Gregor. Your boyfriend!"

Rudolfo looked blank.

"The guy you've been living with for the past three years. The one

*Rudolfo
raised his
tear-stained
face from his
hands. "I've
lost my past,
I've lost my
memories..."*

with the dimples and a thing for Quentin Tarantino movies. The one who did the cute trick with the cheese omelet that I told you I'd have to strangle you if you told me about it one more time. *That Gregor!*"

"I honestly don't know what you're talking about."

"Take out your wallet," Ellen said. "Look in the card holder. You'll find a photo of the two of you together, behind your driver's license."

Rudolfo obeyed. He slid out the photograph and stared wordlessly at it for a long time. Finally he said, "He's gorgeous."

"Well, that's what I've always said," Ellen smiled.

"But I have no memory of him whatsoever," he said in a troubled voice. "Or of any other boyfriends, for that matter. I can't remember my mother. I can't remember my childhood. I don't even believe I had one."

"Now I don't know what *you're* talking about."

Rudolfo sank to the floor, put his head in his hands, and began to cry. Alarmed, Ellen crouched down beside him and put an arm over his shoulder. "Don't cry, Rudy. Whatever the trouble is, it's not that bad."

"It is!" Rudolfo raised his tear-stained face from his hands. "I've lost my past, I've lost my memories, I've lost this boyfriend you tell me I had . . . dear God, what's happening to me?"

"I don't know," Ellen said fearfully. "But it's time we found out. We'll start by talking to Gregor." She lifted the phone and hit speed dial. But the line was dead. She tried clicking the receiver like people did in the movies. Nothing. "Okay, then, we'll go over in person. Where is it you guys live, anyway?"

"In Brooklyn," Dog answered for him.

Determination filled Ellen. "Come on," she said to Rudolfo, "we're going to get to the bottom of this thing."

THERE WAS A ROADBLOCK AT THE BROOKLYN BRIDGE. ALL the cars were being turned back. "Keep moving, keep moving!" the traffic cop shouted.

Ellen shoved Dog aside and stuck her head out the window. "What's going on?"

"Brooklyn is closed."

"What are you talking about? Brooklyn can't be closed. It's a borough, for cripes sake."

"It's closed," the cop repeated, "for repairs." To the cabby he said, "Now clear out before I yank your license!"

So they left. "Did you hear what he said?" Ellen asked, a little hysterically. "He said that Brooklyn was closed for repairs!"

"Does a cinnamon bun taste the same to you as it does for me?" Rudolfo asked in a lifeless monotone. "Do you experience its texture in more detail? Is it buttered? Are there raisins?"

"Rudolfo, you're not making any sense," Ellen stared at the passing buildings. They all looked alike. Had they always been so drab? So . . . unornamented?

"What is it like to live a complete life? One that's continuous, and detailed across the full bandwidth for every physical sense? One in which nothing is experienced in synopsis? I can't imagine how glorious your existence must be."

"What *are* you talking about?"

There was no reply.

When Ellen turned to look, she was—save for Dog—alone in the back seat. "Where'd he go?" she asked in astonishment. "What happened to Rudolfo?"

"I ate him," Dog said.

"Very funny," Ellen shivered and settled back in her seat. This was creepy and then some. Something was seriously wrong.

In silence they rode back uptown.

Rockefeller Center was clogged with people. The cabby leaned on his horn and tried to force a way through, without success. So Ellen paid and got out.

"What's going on?" she asked a stranger.

"They're dedicating a statue." He pointed to where Prometheus used to be. It had been replaced by a new sculpture. Down the avenue she could see parts of the old statue being hauled away; the head, a leg, an enormous bronze hand.

From this angle, the new statue looked like a cutaway model of New York City. Ellen could see all the tiny buildings lining its interior, the skyscrapers like stalactites and stalagmites pointing toward the central axis. Looked at from the outside and seen all at once, it was obviously in the shape of a human figure, legs together and arms out-flung. The torso, she supposed, was Manhattan, with the Village down in the crotch.

A vertiginous wave of unreality washed through her. It was true, she thought. The city *was* formed in the shape of a person. It was so obvious. How could she have never noticed it before?

"Well?" Dog said. "Aren't you going to go around to the front and see who it's of?"

With a bound, it was running ahead of her, barking joyfully. People hurried out of its way, making a path through the crowd which she followed effortlessly around to the front of the statue.

It was her. It was a statue of Ellen Gillespie in a spacesuit.

Ellen shivered. "This is bizarre."

"Think of it as a wake-up call."

"Huh?" Ellen stared down at the shaggy creature beside her. "What do you mean?"

"How obvious do I have to be?" asked Dog. There was a distinct edge in its voice. "Do I have to spell it out for you?"

Ellen looked directly into the animal's eyes. They were hard and cold. Suddenly she was afraid. Suddenly it didn't seem a soft and fluffy and lovable dog at all.

As casually as she could—and continually fighting the urge to run—Ellen pushed her way out of the crowd and across Forty-Eighth to Fifth Avenue, and stuck out her arm. A cab pulled up and she leaped inside, slamming the door before Dog could follow her.

"Where to?" the cabby asked.

"I don't know—out. Away. Queens."

"Closed."

"The Bronx Zoo."

"Not there any more."

"The Whitney!"

The cabby flipped the flag on the meter.

Behind her, she saw Dog raise a paw to hail another cab.

THE WHITNEY WAS HOLDING A BILL VIOLA retrospective. The place should have been thronged. But it was so completely deserted that there wasn't even anybody there to take her money. Her footsteps echoed noisily in the empty galleries. She was pretty sure she'd given her canine pursuer the slip. Now that she had, however, she had no idea what her next move should be.

In bleak desolation, Ellen wandered from installation to installation. In one room she saw her own image, reflected upside down in a drop of water and thrown up on a wall, shimmer and swell and then disappear as the drop fell with a soft *boom* onto a miked tambourine. Under ordinary circumstances, it was exactly the kind of art she liked best. Now it only filled her with dread.

A new drop of water was projected upon the wall. Within it, she saw Dog loom up behind her.

Briefly, she closed her eyes. Then she turned.

"All right," she said. "What's going on?"

"New York City is being deconstructed."

"Why?"

"You've been living in the past," Dog said. "Now it's time to pull yourself together and resume your real life."

With a pedantic wave of a paw, it directed her attention to the wall.

The projected water drop was gone, replaced with a spacesuit caught up in a tangle of machinery adrift in vacuum. Alongside the suit floated a featureless black sphere. Tendrils of energy flowed between suit and sphere. "The year is 2870. A starfreighter was ferrying a singularity engine to Beta Comae Berenices for the colony on New Amsterdam when the engines blew. Everybody died except for one person. The supercargo. You."

"I'm blue collar?" Ellen cried, horrified.

"Supercargo is a perfectly respectable profession." Dog turned toward the screen again. Now it showed a starship breaking up. Atomic fires flared. Bulkheads peeled away. "And you were a good spacer. You kept your head. With only seconds in which to act, you accessed the singularity and gave it a series of commands."

Words flowed across the wall: SEND FOR HELP. KEEP ME ALIVE. KEEP ME SAFE. KEEP ME HEALTHY AND SANE.

"The singularity did what it could. It disassembled what bits of the ship remained to build the subspace distress beacon. That didn't leave much to keep you alive with. So it used what it had: your suit. And your body.

"It took you apart, and with your elements built a microscopic version of ancient Manhattan inside your spacesuit. Then it reconstructed you, with appropriate memories, inside that environment. I think you'll agree that it interpreted your commands well."

"I don't have to listen to this," Ellen said wildly. "I won't!"

She turned her back and walked away. Dog did not follow.

But there was no exit.

There was nothing but the Whitney, with its two-and-a-half floors of video installations, its half-floor of abstract expressionism, its gift shop, and its rather basic ground floor *pâtisserie*. The doors no longer existed, and all the windows looked out upon anymore was human blood and tissue.

All that was left of New York City was this one small bubble of space suspended within a world of her own flesh.

SHE FOUND DOG WAITING FOR HER IN THE *PÂTISSERIE*. Almost in tears, she demanded, "Why are you *doing* this to me?"

"The rescue ship has come," it replied. "New York is no longer needed, so it's being dismantled."

"That's what's become of Stasi, then? And Rudolfo and Gregor and everybody else? They've been destroyed?"

"They never were real. Only you were real. And now it's time for you to rejoin the outer world." Dog lowered its voice persuasively. "That's why I'm here. To ease the way for you."

"Ease the way?"

"It's your turn now." Where a pastry cart had been was now a couch with brocaded red and green roses. "I want you to lie down and close your eyes. This won't take a minute."

"Hey, wait. Hold on here. What if I don't want to?"

"Relax. This won't hurt a bit. You have my word on it."

Ellen thought she detected a trace of unctuousness in Dog's voice. But she wasn't sure. To focus herself, she picked up a bread stick and carefully buttered it on one side, thinking only of the task at hand and how good it would taste. She was about to eat it, in spite of her diet, when a thought came to her.

She put the bread stick, untasted, down on a plate.

"Not so fast," Ellen said slowly. "I said to keep me safe, and I said to call for help, but I didn't say anything about what to do when help came. Your orders didn't say anything about reconstructing me. So if I don't cooperate, I don't have to leave."

For a long moment Dog was silent. Finally it said, "I was hoping you wouldn't realize that."

"Well, I do. And I'm not cooperating!"

"Ellen, the singularity can't look after you and serve the needs of the New Amsterdam colony as well. It's needed there. They've reached the critical population mass where human beings alone can't run the society without wars and economic disasters. There are people dying for lack of what you're selfishly refusing to share."

"I don't care," Ellen said harshly. "Put it back. I want my life just the way it was—Rudy, the Village, my job, everything. You have to keep me healthy and sane, right? Well, this is making me feel distinctly unhealthy. I am definitely having unbalanced thoughts."

Dog sighed. "As you wish. So be it."

EVERYTHING WAS BACK TO NORMAL.

To celebrate, Ellen held a party. She told the caterers from Too Cute to Cook to set out Beluga on crackers, raw tuna wrapped in

kelp, and crudités for the vegetarians, and to keep the Perignon flowing. Then she invited all her very best friends, and a few celebrities from the literary world, with a seasoning of strangers just to keep the mix from getting predictable.

It was fun. For a while.

But there came a moment . . . when Stasi was doing her impression of Richard Nixon vogueing at the Rubber Club, and Rudolfo and Gregor were camping it up and exchanging desperate little kisses in the guise of making fun of themselves, and Tom Disch and Joyce Carol Oates were analyzing the latest John Grisham novel with delicate mockery, and a handsome stranger—a stockbroker who had come in with Esme and then highhandedly abandoned her—was giving Ellen the eye from the far side of the room . . . that she realized how empty it all felt.

None of it really mattered. None of them was real.

It was like finding herself trapped inside a television sitcom. Everybody was manic. Everybody was funny. They were all doing their damndest to amuse her. And it had all the charm of canned laughter.

Meat puppets, she thought. They're all nothing more than meat puppets.

The handsome young stockbroker chose that moment to make his move. He strolled over to Ellen's chair and, putting one hand on its back, leaned over to murmur a cynical witticism in her ear. As he did, the other hand lightly clenched her knee.

Revolted, she pushed him away.

She shoved him so hard that he fell over backward, right on his Armani-clad ass. Then Ellen stood and shouted, "Get out!"

The party fell silent. Everybody looked at her, shocked.

"Get out, get out, get out! You're not real, any of you! Why should I pretend you are?" And then, as mouths opened in protest, "Don't look hurt either!"

Mouths closed. Faces blank, her guests obediently filed out. In less than a minute the room was empty.

Ellen began to cry.



ELL," SOMEBODY SAID, "IS NO OTHER people."

Ellen looked up. Dog stood in the doorway. "Had enough?" it asked.

She nodded wearily.

"Good." Taking her by the hand, Dog gently led Ellen to her bedroom. It sat her down on the bed. Through the open window she could hear the city noises—traffic, sirens, saxophones—one by one shut themselves off.

Silence enfolded the universe.

At Dog's direction, Ellen kicked off her shoes and lay on her back. The mattress was soft and comforting. She crossed her hands on her chest. "What do I do now?"

"Close your eyes," Dog said.

"I'm afraid."

"There'll be an instant of darkness. Then you'll wake up in the larger world—the real world."

A sudden spasm of doubt hit Ellen then, as cold and hard as a cupronickel asteroid in a decades-long orbit around a dead star. "Suppose I don't wake up? What if I just cease to be like all my friends? I don't want that to happen to me."

"Your rescuers are scrambling out of their airlock," Dog said soothingly. "They're desperate to save you. They're coming just as fast as they can."

"But I only have your word for that!"

"Now they can see your suit. Their hearts are filled with joy and hope. They're flying toward you with arms extended."

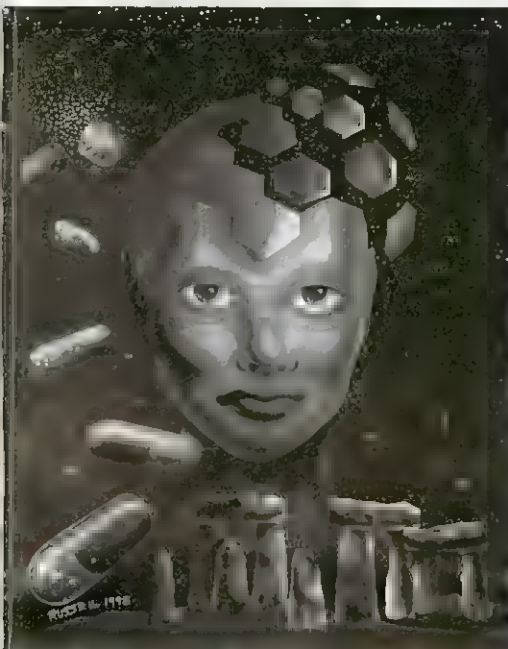
A silk-soft paw brushed lightly over her face from forehead to chin. Reflexively, her eyelids fluttered shut.

"Have faith," Dog said.

The darkness closed about her like a mouth. □

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THE TOMORROW PLAGUE DEVASTATED
SOCIETY, UNTIL THERE CAME A CURE
MORE DREAD THAN THE DISEASE.

IN FUTURE

1.

THE TRUCK AHEAD BRAKED ABRUPTLY, AND GREG FOLLOWED SUIT. BESIDE HIM, HE FELT HIS WIFE TENSE, PUSHING AT THE FLOOR ON THE PASSENGER SIDE WITH THE HEEL OF HER BLACK LEATHER PUMP.

"Slow down," she said.

"I'm not going that fast," he said.

Leanne never drove on the highway. Which didn't stop her from offering a critique on his own driving performance.

"Watch that green car," she said.

"I see it," he said, as a green Trans-Am hurtled from nowhere to cut in front of them.

And then he didn't see it.

"What the hell?"

The green car had become some kind of space capsule with no visible wheels, and so had all the other cars around him. And the three lanes of the highway had somehow multiplied into 12. Even more alarming, there was

another road right above his head, except that it was transparent, and through it he could see 12 more lanes of traffic. And when he looked down through the road he was driving on, he saw more traffic and more capsule-like cars, all hurtling along like bats out of hell.

He pushed down instinctively on the brake, except that there was no brake. He tried to twist the steering wheel, except there was no steering wheel, only a kind of metal bar.

"Change of navigational program?" inquired a polite melodious voice.

But Greg was staring at his hands, which seemed to be embedded with bits of crystal.

BY ANDREW WEINER
ILLUSTRATION BY MOEBIUS



"Change of navigational program?" the car inquired again.

"Get us out of here."

"Next off-ramp?"

"Do it."

As if by magic, a hole opened up in the road ahead of them, and the car plunged down through it, down and down, like an elevator dropping through the layers of traffic. It came to rest at last on what looked like an ordinary residential street.

Greg pushed the car door open and stumbled out.

"Are you all right?" he heard Leanne ask, and when he looked back he saw that the car had reverted to its usual form, and so had the elevated highway above them.

"Yeah," he said, examining his hands, which were their usual fleshy nature. "But maybe you should drive."

2. In the meeting room, Jean felt drowsy. Strategic planning had never been one of her biggest interests, and they had been going at it for hours, and this room was much too warm.

"You need to visualize," the highly paid strategic planning consultant was saying, "what your business will look like next year, and the year after, and the year after that..."

Soon, Jean thought, they would ask her, as Vice President of Human Resources, what kind of people they should be hiring in the future, and she would have to act as if she knew.

Without warning, Don Smithfield, the President and CEO, began, abruptly, to cry.

"We don't have a business," he told them, tears running down his face. "Our business is over."

"What are you talking about, Don?" one of the executives asked. "We make breakfast cereal. People will always eat breakfast cereal."

"Not always," Don said, gasping for air. "Not always."

Jean was hungry. She opened up her purse and rummaged for a food capsule. Then she took out her compact and began to reapply her face paints.

Beside her, Vince Lewin, the vice president of marketing, had put a TV bubble on his head and was viewing his messages.

"Well," the consultant said, "I guess my work here is done."

He took a rocket-pack out of his briefcase, strapped it on his back, and flew out the window.

3. "The future," said the college professor, "is best understood as a kind of consensual hallucination...the aggregation of our hopes and fears and dreams."

He turned and raised his hand to write on the blackboard with a piece of chalk. But the blackboard had become some sort of light screen, and he was no longer holding any chalk. Instead, he was writing on the screen with his index finger, which was sheathed in metal, and glowed ruby red at the tip. He stared at what he had written on the light screen: "Consensual hallucination." He turned around.

The girl in the front row with the purple antennae was raising her hand. She stared at him intently through the twin cameras that were now her eyes. "Is this going to be on the test?" she asked, her antennae bobbing.

4. "...no reason to panic," said the white-haired man on the TV. "These are clearly instances of a kind of mass hysteria, a form of pre-millennial tension, if you will."

"So people aren't really seeing the future?" the interviewer asked

"Of course not," said the white-haired man. "That's simply not

possible."

A flickering caption identified him: "Dr. Ronald Fishbein, professor of social psychology."

"But why this, as you say, pre-millennial tension?"

"Isn't it obvious, Barbara? We've all been overwhelmed with future-hype, with this belief that everything is about to radically change. That we're about to be utterly transformed, all because of some quirk of the calendar..."

Dr. Fishbein trailed off in mid-flight, and began to stare, intrigued, at the interviewer, whose hair had changed from a blonde helmet to a mass of waving green tentacles.

"What have you done," he asked, "to your hair?"

The interviewer glanced up at the monitor. "I don't know," she said. "But I rather like it. And I must say the same for your teeth."

Dr. Fishbein looked up at the monitor and stared, fascinated at his jewel-encrusted teeth. He admired in particular his emerald molars.

"Rather fetching," he said, "aren't they?"

He raised his arm and looked at the clock display embedded in his wrist.

"Well," he said. "I have to be running along. But I do hope I cleared things up for you."

5. "We've tracked the cause of TDS," the Chief Science Advisor told the President. "TDS?"

"Temporal Displacement Syndrome. That's what we're calling it."

"That's good," the President said. "It's good to have a name for it."

"TDS has an actual physical basis," the chief science advisor said,

**QUANTUM SCIENTISTS
ARE ALREADY PRODUCING
EXAMPLES OF NON-LOCAL
CAUSALITY. IN FUTURE,
SCIENTIFIC THEORY
MAY ALLOW FOR
BACKWARD CAUSALITY.**

"in the temporal lobes of the human brain. We've tracked clear changes in bioelectrical activity accompanying these episodes."

"Which means what, exactly?"

"We don't know...We know that the temporal lobes are sensitive to outside stimulation—in the case of epilepsy, for example, they can be triggered by strobe lights. There's also some speculation that electromagnetic activity, for example in earth lights, affects the temporal lobes and can trigger parapsychological episodes—hauntings, UFO contactee experience, and the like."

"But how does that explain these future flashes?"

"We think the source of these episodes is some kind of unusual energy release. We thought at first it might be increased solar activity, but there's no evidence of that."

"So what is causing it?"

"One hypothesis is that it's some kind of direct energy transfer from the future. That sounds a little farout, admittedly. But we're right on the border of tomorrow, it's being born right around us. Maybe it can't

Continued on page 94

TERRAFORMING

Planet Earth has been destroyed.

(1)

We are clones, the last survivors of the great impact. The bodies of our parents have lain a hundred years in the cemetery on the rubble slope below the crater rim. I remember the day my robot-father

brought the five of us up to see the Earth, a hazy red-spattered ball in the black Moon sky.

"It looks—looks sick." Looking sick herself, Dian raised her face to his. "Is it bleeding?"

"Bleeding red-hot lava all over the land," he told her. "The rivers all bleeding iron-red rain into the seas."

"Dead." Arne made a face. "It looks dead."

"The impact killed it." His plastic head nodded. "You were born to bring it back to life."

"Just us kids?"

"You'll grow up."

"Not me," Arne muttered. "Do I have to grow up?"

"So what do you want?" Tanya grinned at him. "To stay a snot-nosed kid forever?"

"Please." My robot-father shrugged in the stiff way robots have, and his lenses swept all five of us, standing around him in the dome. "Your mission is to replant life on Earth. The job may take a lot of time, but you'll be born and born again till you get it done."

Your job is to bring it back to life.

TERRA

BY JACK WILLIAMSON

We knew OUR NATURAL PARENTS FROM their letters to us and their images in the holo tanks and the robots they had programmed to bring us up. My father had been Duncan Yare, a lean man with kind gray eyes and a neat black beard when I saw him in the holo tanks. He had a voice I loved, even when he was the robot.

The dome was new to us, big and strange, full of strange machines, wonderfully exciting. The clear quartz wall let us see the stark earth-lit moonscape all around us. We had clone pets. Mine was Spaceman. He growled and bristled at a black-shadowed monster rock outside and crouched against my leg. Tanya's cat had followed us.

"OK, Cleo," she called when it mewed. "Let's look outside."

Cleo came flying into her arms. Jumping was easy, here in the Moon's light gravity. My robot-father had pointed a thin blue plastic arm at the cragged mountain wall that curved away on both sides of the dome.

"The station is dug into the rim of Tycho—"

"The crater," Arne interrupted him. "We know it from the globe."

"It's so big!" Tanya's voice was hushed. She was a spindly little girl with straight black hair that her mother made her keep cut short, and bangs that came down to her eyebrows. Cleo sagged in her arms, almost forgotten. "It—it's homongoolius!"

She stared out across the enormous black pit at the jagged peak towering into the blaze of Earth at the center. Dian had turned to look the other way, at the bright white rays that fanned out from the boulder slopes far below, spreading to the pads and gantries and hangars where the spacecraft had landed, and reaching on beyond, across the waste of black-pocked, gray-green rocks and dust to the black and starless sky.

"Homongoolius?" Dian mocked her. "I'd say fractabulous!"

"Homon-fractabu-what?" Pepe made fun of them both. He was short and quick, as skinny as Tanya was, and just as dark. He liked to play games, and never combed his hair. "Can't you speak English?"

"Better than you." Dian was a tall pale girl who never wanted a pet. The robots had made dark-rimmed glasses for her because she loved to read the old paper books in the library. "And I'm learning Latin."

"What good is Latin?" Cloned together, we were all the same age, but Arne was the biggest. He had pale blue eyes and pale blond hair, and he liked to ask questions. "It's dead as Earth."

"It's something we must save." Dian was quiet and shy and always serious. "The new people may need it."

"What new people?" He waved his arm at the Earth. "If everybody's dead—"

"We have the frozen cells," Tanya said. "We can grow new people."

Nobody heard her. We were all looking out at the dead moonscape. The dome stood high between the rock-spattered desert and the ink-black shadow that filled the crater pit. Looking down, I felt giddy for an instant, and Arne backed away.

"Fraidy cat!" Tanya jeered him. "You're gray as a ghost."

Retreating farther, he flushed red and looked up at the Earth. It hung high and huge, capped white at the poles and swirled with great white storms. Beneath the clouds, the seas were streaked brown and yellow and red where rivers ran off the dark continents.

"It was so beautiful," Dian whispered. "All blue and white and green in the old pictures."

"Before the impact," my father said. "Your job is to make it beautiful again."

Arne squinted at it and shook his head. "I don't see how—"

"Just listen," Tanya said.

"Please." My robot-father's face was not designed to smile, but his voice could reflect a tolerant amusement. "Let me tell you what you are."

"I know," Arne said. "Clones—"

"Shut up," Tanya told him.

"Clones," my robot-father nodded. "Genetic copies of the humans who got here alive after the impact."

"I know all that," Arne said. "I saw it on my monitor. We were born down in the maternity lab, from the frozen cells our real parents left.

And I know how the asteroid killed the Earth. I saw the simulation on my monitor."

"I didn't," Tanya said. "I want to know."

"Let's begin with Calvin DeFalco." Our robot-parents were all shaped just alike, but each with a breastplate of a different color. Mine was bright blue. He had cared for me as long as I remembered, and I loved him as much as my beagle. "Cal was the man who built the station and got us here. He died for your chance to go back—"

Stubbornly, Arne pushed out his fat lower lip. "I like it better here."

"You're a dummy," Tanya told him. "Dummies don't talk."

He stuck his tongue out at her, but we all stood close around my robot-father, listening.

"Calvin DeFalco was born in an old city called Chicago. He was as young as you are when his aunt took him to a museum where he saw the skeletons of the great dinosaurs that used to rule the Earth. The bones were so big that they frightened him. He asked her if they could ever come back.

"She tried to tell him he was safe. They were truly dead, she said, killed by a giant asteroid that struck the coast of Mexico. That frightened him more. She told him not to worry. Big impacts came millions of years apart. But he did worry about how anybody could survive another impact.

"His first idea was a colony on Mars. He trained to be an astronaut and led the only expedition that ever got there. It turned out to be unfriendly, unfit for any self-sustaining colony. Most of the crew was lost, but Cal returned so famous he was able to persuade the world governments to set up Tycho Station.

"Live men and women worked here to build it, but they went home when the humanform robots were perfected. They left the robots to run the observatory and relay observations. If they ever saw trouble coming they were to call a warning to Earth—"

"But the killer did hit!" Arne broke in. "Why didn't they stop it?"

"Shhh!" Tanya scolded him. "Just listen."

He rolled his eyes at her.

"Everything went dreadfully wrong." My robot-father's voice fell with my real father's sadness. "The asteroid was mostly iron and bigger than the one that killed the dinosaurs. It came fast, on an orbit close around the Sun that hid it from the telescopes. Nobody saw it till there was no time to steer it away. But still they had a little luck."

"Luck?" Arne made a snarly face. "When the whole world was killed?"

"Luck for you," my robot-father told him. "Your father wasn't on what Cal called his survival squad. That was the little handful of people picked for essential skills and chosen to form a sturdy gene pool. He was Arne Linder, a geologist who had written a book about terraforming Mars—changing it to make it fit for people. Cal had wanted him on the Mars expedition, but he didn't like risk. Without the odd stroke of luck that got him to the Moon, you wouldn't exist."

Arne gulped and blinked.

"Cal had been flying a supply plane out to the station every three months. The impact caught it on the ground in New Mexico, partly loaded for the next flight, but it was not yet fueled. The survival team was scattered everywhere. Linder was in Iceland, thousands of miles away. And your mother—"

His lenses turned and his voice warmed for Tanya. "She was Tanya Wu, the team biologist. Her job was installing the maternity lab. The warning caught her in Massachusetts, far across the continent, gath-

**'Kiss your wives
them, 'kneel**

ering frozen cells and embryos for the cryonics vault. She got here just in time to save herself and her cat. Your Cleopatra is its second clone."

Cleo was purring in Tanya's arms, her yellow eyes blinking sleepily at the blazing Earth.

"And you, Pepe—" The lenses swung to him. "Your father was Pepe Navarro, an airplane pilot. On that last day, he was in Iceland with Linder on a seismic survey. They just barely got back to White Sands." The lenses gleamed at Arne. "That's why you're here."

"Mel!" Dian begged him. "What about me?"

"You?" My robot-father's face showed no feelings, but his voice laughed at her eagerness in a kind but teasing way. "Your clone mother was Diana Lazard. She was curator of the hall of humanities in a big museum till Cal picked her to help him select what they must plan to save. Our museum level is filled with her books and artifacts. Sealed now, but you'll all study there when you are older."

"It's Dunk's turn." Tanya grinned at me.

"OK." His voice smiled at her and Cleo before he turned more seriously to me. "I was a science news reporter. Cal had hired me to do publicity for the station. It cost a lot of money, and we had to sell it to the skeptics. I happened to be at White Sands when the asteroid fell, waiting to do a story on the new maternity lab. My own good luck."

"And Spaceman?" I asked. "He was your dog?"

"Actually, no." He almost laughed. "I never had time for a pet, but Cal liked dogs. Spaceman's clone dad was a stray that happened to run across the field just before we took off. Cal called him. He jumped aboard, and here he is. A really lucky dog."

"Lucky?" Arne stood scowling out across the blazing moonscape, where nothing had ever lived. "When he's dead? Like our folks are dead, and all the Earth?" He looked at me and Spaceman, with something like a sneer. "Do you call us lucky to be clones?"

My father had no answer ready.

"We're alive," Tanya said. "Don't you like to be alive?"

"Here?" I saw something like a shiver. "I don't know."

"I do." Pepe caught my father's plastic hand. "I want to know all about the impact and what we can do about it."

"I hoped you would." My father hugged him and spoke to all of us.

"The asteroid was a chunk of heavy rock, potato-shaped and 10 miles long, probably a fragment from some larger collision. Cal had worked hard to have the station ready, but nobody could have been ready for anything so big.

"The warning got to White Sands about midnight on Christmas Eve. We might have had more time, but the duty man had come late from a party and gone to sleep at his post. We all might have died, but for a janitor who happened to see a red light flashing and called Cal. By then, we had only six hours.

"On holiday, people were away from home, impossible to reach. Although the supply plane was standing on the pad, we had a million things to do and no time for anything. Cal tried to keep the news off the air for fear of total chaos. A smart precaution, maybe, he couldn't explain our haste to get off the pad. Fuel had been ordered but not delivered. We had to wait for Dr. Linder and Dr. Wu and more supplies. A hellish time."

My robot-father's voice had gone quick and trembly.

"But also a time of magnificent heroism. Cal finally had to tell our people there on the field—tell them they had only hours to live. You can imagine how desperately they must have wanted to be with their families, but most of them stayed at the job, working like demons.

"In spite of us, the news got out. Dozens of reporters and camera crews swarmed to the field. Cal had to confirm the story, but he begged them not to kill whatever chance we had. Kiss your wives goodbye,' I heard him tell them, kneel in prayer, or just get drunk.' I don't know what they reported, but all the TV and radio stations soon went silent.

"We were still on the ground when the asteroid came down in the Bay of Bengal, south of Asia. We had too little time to get into the air before the shockwaves got through the Earth to us at White Sands. The P waves first, just a few minutes ahead of the more destructive surface waves.

"Navarro and Linder got in from Iceland. Dr. Wu landed in a chartered jet. The work crews loaded what they could. We made it, but barely. We were hardly a thousand feet off the pad when buildings around the field began to crumble and yellow dust came up to hide everything.

"Earth died behind us."

(2)

"BUT YOU GOT AWAY!" PEPE WAS ROUND-EYED WITH WONDER. "YOU were heroes!"

"We didn't feel heroic." My robot-father's voice was solemnly slow and low, almost a whisper. "Think of all we'd lost. We felt very lonely."

His naked plastic body quivered with something like a shudder and his eye lenses slowly swept us all.

"Christmas Day." He went silent, remembering. "It should have been a happy time. My married sister lived in Las Cruces, a city near the base. She had two kids, just five years old. I'd bought trikes for them. She was making dinner, baked turkey and dressing, yams, cranberry sauce—"

His voice caught and he stopped for a second.

"Foods you've never had, but we liked them for Christmas. My father and mother were coming from Ohio. He had just retired. She was in a wheelchair from a car accident, but they were going on around the world. A trip they had planned all their lives. They never knew they were about to die. My sister called, but I couldn't tell—" He stopped again, and his voice seemed strange. "Couldn't even say goodbye."

"What's a trike?" Arne wanted to know.

My father just stood there, looking up at the iron-stained Earth, till Pepe nudged his plastic arm. "Tell us how you got away."

"I hadn't been on the survival team. Cal brought me in place of an anthropologist who was on a dig in Mexico. I guess we should have been glad to get away. But there on the plane, looking back at the terrible cloud already hiding half the Earth, none of us felt good about anything."

He looked at Dian.

"Your mother opened her laptop and lay crying over it till Dr. Wu gave her something that put her to sleep."

"She lost her nerve." Arne made a face at Tanya. "My father was braver."

"Maybe." My father made something like a laugh. "Pepe's father was our pilot, and cool enough. He took us all the way out to orbit before he gave the controls to Cal. He'd brought a liter of Mexican tequila. He drank most of it and sang sad Spanish songs and finally

goodbye,' I heard him tell
in prayer, or just get drunk.'

slept till we got to the Moon."

"It's dreadful to see." Dian stood gazing up at the Earth, speaking almost to herself. "The rivers all running red, like blood pouring into the oceans."

"Red mud," my robot-father said. "Silt colored red by all the iron that came from the asteroid. Rain washes it off the land because there's no grass or anything to hold it."

"Sad." When she looked at him I saw tears in her eyes. "You had a sad time."

"Tell us," Tanya said. "Tell us how it really was."

"Bad enough." He nodded. "Climbing east from New Mexico, we met the surface wave coming around the Earth from the impact point. The solid planet was rippling like a liquid ocean. Buildings and fields and mountains were rising toward the sky and dissolving into dust."

"The impact blew an enormous cloud of steam and shattered rock and white-hot vapor up through the stratosphere. Night had already fallen on Asia. We passed far north, but we saw the cloud, already fading and flattening, but still glowing dull red inside."

"Clouds had covered all the Earth by the time we came around again. A rusty brown at first, but the color faded as the dust settled out. Higher clouds condensed till the whole planet was bright and white as Venus. It was beautiful." His voice fell. "Beautiful and terrible."

"Everybody?" Whispering, Dian wiped at her tears. "Was everybody killed?"

"Except us." His plastic head nodded very slowly. "The robots here at the station recorded the last broadcasts. The impact made a burst of radiation that burned communications out for thousands of miles. The surface wave spread silence all around the world."

"A few pilots in high-flying aircraft tried to report what they saw, but I don't know who was left to hear. Radio and TV stations went off the air, but a few hardy souls kept on sending to the end. A cruise liner in the Indian Ocean had time to call for help. We picked up a reporter's video of the shattering Taj Mahal, the way he saw it by moonlight."

"An American astronomer guessed the truth. We caught a White House spokesman trying to deny it. Just a sudden solar flare, he said, with no verified reports. His voice was cut off before he finished. Watching from a thousand miles up, we saw the great wave rolling up out of the Atlantic. It washed all the old cities off the coast. The last words we heard came from White Sands. A drunk signal technician wishing us a Merry Christmas."

"You got here." Pepe grinned cheerfully. "But what happened to Mr. DeFalco?"

"There's a robot for him," Tanya said. "I saw his frozen cells in the vault."

"A tragedy." My robot-father's stiff face had no expression, but his voice was bleak. "Cal got with us to the Moon, but he died before he had the computer programmed to teach his clones, but he was the real hero. Earth had been hit so hard that our mission looked impossible, but he never gave it up."

"He tried to keep us too busy to fret about anything. We unloaded the plane and stored the seed and embryos and frozen life cells in the cryonic vault. We had to get used to lunar gravity, which meant a lot of sweating in the centrifuge to keep our bodies fit. We had to clean the hydroponic gardens and get them growing again."

"Still hoping somebody or something had survived, Cal spent most of the nights up here at the telescopes. Earth was then a huge white pearl, dazzling with sunlight but mottled with volcanic explosions. He never saw the surface."

"The second year, he decided to go back—"

"Back to that?" Arne was startled. "Was he crazy?"

"That's what we told him. We'd seen no sign of life—nothing at all through those glaring clouds—but he kept imagining isolated survivors somehow hanging on. If anybody was there, he wanted to help."

"Three of us went down. Pepe at the controls. Cal with his search gear. I kept a video narrative. Flying low enough to look, all we saw was death. The impact had burned cities and forests and grasslands. The polar ice had thawed. Lowlands were flooded, coastlines changed. We found the land like you see it now, black and barren,

pouring red mud into the oceans. No spark of green anywhere.

"Hoping for anything alive in the oceans, Cal had Pepe bring us down on the shore of a new sea that ran far into the Amazon valley. I got a whiff of the air when we opened the lock. It had a burnt-sulfur stink and set us all to coughing. In spite of it, Cal was determined to get samples of mud and water to test for microscopic life."

"We had no proper gear but he tried to improvise, with a plastic bag around his head and an oxygen bottle with a tube to his mouth. We watched from the plane. A dismal view. Jagged slopes of dead black lava from a cone north of us. No sun anywhere. A towering storm rising in the west, alive with lightning."

"Cal had a radio. I tried to copy what he said, but the plastic made him hard to hear. He tramped down to the water, stooping to pick up rocks and drop them in his sample bucket. Nothing green," I heard him say. "Nothing moving." He looked at the smoking volcano behind him and the blood-colored sea ahead. "Nothing anywhere."

"Pepe was begging him to come back, but he muttered something I couldn't make out and stumbled on over the frozen lava, down to a muddy little stream. Squatting there at the edge of it, he scraped up something for his bucket. We saw him double up with a coughing fit, but he got back to his feet and waded on down the beach, into a surf that was foaming pink."

"Pepe called again, warning him to come back. He waved a sample bottle. Our best chance." His voice was a strangled croak, but I got a few words. "If anything survived in the sea. I hope—"

"Hope. Choking on that last word, he tried to get his breath and failed. He lost the radio and his bucket. He stumbled a few yards toward us before he tripped and fell. The oxygen bottle floated away. We saw him grabbing for it, but the next wave took it out of his reach."

"You left him there?" Dian's voice rose sharply. "Left him to die?"

"We left him dead. Pepe wanted to help him, but he'd gone too far. His oxygen gone, the air had killed him."

"Air?"

"Bad air." My robot-father's helpless shrug was almost human. "Mixed in the volcanic gases in the whiff I caught, there was cyanide."

"Cyanide?" Pepe frowned. "Who put it there?"

"It came from cometary cyanogen from the asteroid."

"Poisoned air!" Arne turned pale. "And you want us to go back?"

"To help nature clean it." His lenses swept the five of us. "If no green plants are left to restore the oxygen, you must replant them. Cal died with his work undone. It's yours to finish."

(3)

THE MISSION LEFT TO US, TO US ALONE, WE DIED AND LET THE ROBOTS sleep while an ice age passed on Earth. The maternity lab delivered us again, and once more our dead parents brought us up.

My robot-father was always with me. He taught me to spell, taught me science and geometry, counted time when I was working out on the treadmill in the centrifuge.

"Keep yourself fit," he used to tell me. "I can last forever, but you're only human."

He made me work till I was panting and dripping sweat.

"You have your clone father's genes," he reminded me again. "You'll never be him, but I want you to promise you'll never give up our noble mission."

My hand on my heart, I promised.

Pepe's robot-father taught him the multiplication tables and rocket engineering and trained him to box. The boxing was to make him quick with his wits and quick on his feet.

"You'll need all that," he said, "when you get to Earth."

Pepe liked to compete. He was always wanting to work out with Arne and me. He beat me till I'd had enough. Arne was big enough to knock him across the centrifuge, but he kept coming back for more.

Tanya's robot-mother taught her how to care for a baby-sized doll, taught her biology and the genetics she might need for terraforming Earth. Working in the maternity lab, she learned to clone frogs and

Down at the pool on the bottom level, she appeared in a red swimsuit she used to wear into my dreams.

dissect them, but she refused to dissect any kind of cat.

Arne's robot-father helped him learn to walk, taught him the geology terraforming science. His first experimental project was a colony of cloned ants in a glass-walled farm.

"We can't exist alone," his clone father told him. "We evolved as part of a biocosm. In the cryonic vault, we have seed and spores and cells and embryos to help you rebuild it."

In the nursery and the playroom while we were small, later in the classroom and the gym, we learned to love the robots. They loved us as well as robots could. They were immortal. Sometimes I envied them.

I felt SAD FOR OUR PARENTS AND THEIR EARTH, DEAD a hundred thousand or perhaps a million years. The robots couldn't say how long. They had been awakened only when the computer found Earth once more warm enough for life.

We saw them only in their images, speaking to us from the holo tanks. My own holo father, when he was my teacher, appeared as a tall slim man in a dark suit, wearing a narrow black mustache. Counting pushups when I worked out in the centrifuge, he looked younger and wore a red sweatsuit and no mustache. More relaxed at times when he talked of his wife and their home and their work together, he was in a purple dressing gown. Lecturing from the tank, he sometimes waved an empty pipe.

He tried to teach me the art of history.

"I was doing books and scripts about the project before the impact," he said. "You're to carry on the story I began. That will be important to whoever follows us."

Except for the gold plate on her flat chest, Tanya's robot-mother looked like all the other robots, but her holo mother was tall and beautiful, not flat-chested at all. She had bright gray-green eyes and thick black hair that fell to her waist when she left it free.

In the classroom tank, teaching us biology, she wore a white lab jacket. In the gym tank, teaching us to dance, she was lovely in a long black gown. Down at the pool on the bottom level, she appeared in a red swimsuit she used to wear into my dreams. There was no real piano, but she sometimes played a grand piano in the tank, singing songs she had written from her memories of life and love on Earth.

Tanya grew up as tall as she was, with the same bright greenish eyes and sleek black hair. She learned to sing the same songs in the same rich voice. We all loved her, or all of us but Dian, who never seemed to care if anybody loved her.

Dian's holo mother, Dr. Diana Lazard, was smaller than Tanya's, with a chest as flat as the gray name-plate on her robot. She wore dark glasses that made her eyes hard to see. Her hair was a red-gold color that might have been beautiful if she'd let it grow longer, but she kept it short and commonly hid it under a tight black tam. She taught Dian French and Russian and the histories of literature and art, and showed the rest of us nearly all we ever knew about the old Earth.

"Knowledge. Art. Culture." Her everyday voice was dry and flat, but it could ring when she spoke of those treasures and her fear they would be forever lost. "They matter more than anything."

In her classroom, we put on VR headsets that let her guide us over the world that had been. In a virtual airplane, we flew over the white-

spired Himalayas and dived down to the river that had carved out the Grand Canyon and crossed Antarctica to the ice desert at the pole. We saw the pyramids and the Acropolis and the newer Sky Needle. She guided us through the Hermitage and the Louvre and the Prado. She wanted all of us to love them, and all lost Earth.

Dian did. Growing up in her mother's image, she cut her hair just as short and kept it under the same black tam and wore the same dark glasses.

If she cared for anybody, it was Arne.

His clone father, Dr. Linder, had been a muscular giant whose athletic scholarships had paid his way to degrees in physics and geology. Just as big and just as smart, Arne ran every day on the treadmill in the centrifuge. He learned everything our parents taught and wore the VR gear to tour the lost world with Dian and played chess with her. Perhaps they made love; I never knew.

We had no children. As much as most of us might have wanted them, they were not in DeFalco's plan. The maternity lab, as Tanya's mother explained, was only for clones. The robots gave us contraceptives when we needed them.

Tanya did. Our biologist, she understood sex and enjoyed it. So did Pepe. From their teens, they were always together, never hiding their affection. In spite of Pepe, however, Tanya was generous to me.

Once, dancing with her in the gym, I was so overcome with her scent and her voice and the feel of her lithe body in my arms that I whispered a confession. With Pepe glaring after us, she led me out of the room and up to the dome.

The Earth was new, a long curve of red fire slashed across the black and soundless night, lighting the dead moonscape to a ghostly pink. In the dimness of the dome, she stripped to reveal her enchantment, stripped me while I stood trembling with a dazed elation.

In the Moon's mild gravity, we needed no bed. She laughed at my ignorance and proceeded to teach me. Expert at it, she seemed to relish the lesson as keenly as I did. We were a long time there, the dance over and only the robots awake when we went back down. Kissing me a long goodnight that I shall never forget, she whispered that with practice I might be better than Pepe. Sadly for me, however, it never happened again.

She must have given Pepe some consolation, because he held me no grudge. Afterward, in fact, he seemed more amiable than ever, perhaps because of our shared devotion. He got on less well with Arne, who played his endless chess with Dian and roamed the old Earth in his VR cap to study DeFalco's plan for restoring the planet. He wanted to be our leader. That leader, of course, should have been DeFalco's clone, but the robot with his name on the white plate stood dead in its corner of the stock room, gray beneath millennia of Moon dust.

The year we were 25, our robot parents gathered us into the gym. We found our gene parents already there in the big holo tank, all in their most formal images and looking very serious.

"The time has come for your own flight to Earth." My father spoke for them. "Your training is complete. Remote sensors show the ice age is over. The robots have fueled the two-place Moon jumper and loaded it with seed pellets. Two of you can go, taking off when you are ready."

"I am." Glancing at Tanya, Pepe lifted his voice. "Today, if we can."

"You will be the pilot." My father smiled and turned to Arne. "Lin-

der, you're the trained terraformer. You will go to disperse the seed."
Flushing pink, Arne shook his head.

(4)

ARNE STOOD SHAKING HIS HEAD, SCOWLING AT OUR PARENTS IN THE holo tank. Dian stepped to his side and slid her arm around him.

"Damn DeFalco!" His lip jutted defiantly. "Damn his crazy plan! It doesn't fit the facts. The asteroid was bigger than he ever imagined. It sterilized the planet and shattered a lot of the crust. It's still recovering, the ice caps receding, but there's still alarming seismic instability. I think we ought to let it wait for another generation."

"Arne!" Tanya shook her head in pained reproof. "Its albedo says it's warm enough. Ready for us now."

"If you believe albedos."

Our holo parents stood frozen in the tank, their eyes fixed on Arne as if the master computer had never been programmed for such a rebellion, but Tanya made a face at him.

"Army Barny!" Mocking him, her voice turned shrill as it was when she was three. "Under all the bluff, you've always been a fraidy cat. Or are you just a coward?"

"Please, Tammy." Pepe touched her arm. "We're all grown up." He turned very soberly to Arne. "And we can't forget why Dr. DeFalco put us here."

"DeFalco's dead."

"Given time, we'll all be dead. And dead again." Pepe shrugged. "But really we don't have to care. We can always be replaced."

"Three cheers for Cal DeFalco!" Arne had flushed with emotion, but he shook his head at Tanya with a sort of forced deliberation. "You call me a coward. I'd say prudent. I know geology and the science of terraforming. I've spent thousands of hours surveying the Earth with telescopes and spectroscopes and radar, studying oceans and floodplains and lowlands.

"And I've found nowhere fit for life. The seas are still contaminated with heavy metals from the asteroid, the rivers still leaching more lethal stuff off the continents. We'd find the atmosphere unbreathable. Oxygen depleted. Carbon dioxide enough to kill you. Sulfur dioxide from constant new eruptions. Climates too severe to let life take root anywhere. If we've got to make some crazy effort in spite of all the odds, at least let's wait for another 10 or 20 years—"

"Wait for what?" Tanya cut in more sharply. "If an ice age wasn't long enough to cleanse the planet, what kind of miracle do you expect in 10 or 20 years?"

"We can gather data." Arne dropped his voice, appealing to reason. "We can update the plan to fit the Earth as we expect it to be in 10 or 20,000 years. We can train for our own mission, if we must finally undertake it."

"We've trained." Pepe waited for Tanya to nod. "We've studied. We're as ready as we'll ever be. We're going. I say now."

"Not me." Arne hugged Dian to him, and she smiled into his face. "Not us."

"We'll miss you." Pepe shrugged and turned to me. "How about it, Dunk?"

I gulped and caught my breath to say OK, but Tanya had already clutched his arm. "I'm the biologist. I understand the problems. I've

found oxygen masks ready for us in the stock room. Just take me down. I know how to sow the seed."

They took off together, Pepe flying the space plane, Tanya filing radio reports as they surveyed the Earth from low orbit. She described the shrunken ice caps, the high sea levels, the shifted shorelines that made familiar features hard to recognize.

"We need soil where seed can grow," she said. "Hard to pinpoint from space if it does exist at all. Rocks do crumble into silt, but the rains are scouring most of that into the sea for lack of roots to hold it. We'll try to seed from orbit, but I want to land for a closer look."

Dian asked them to look for any relics of human civilization.

"Relics?" Tanya was sarcastic. "Ice and time have erased the great pyramids. The big dams. The Great Wall of China. Everything large enough to look for."

"No surprise," Arne muttered. "The impact has remade the Earth, but not for us."

"Our job." Pepe's voice. "To make it fit."

"A brand-new world!" Tanya's irony was gone. "Waiting for the spark of life."

On the mike, Arne had technical questions about spectrometer readings of solar radiation reflected from the surface and refracted through the atmosphere, questions about polar ice, about air and ocean circulation. Data, he said, that we ought to record for the next generation.

"We're here to replant the planet." Tanya grew impatient. "And too low over the equator to see atmosphere or ocean circulation patterns. Heavy clouds hide most of the surface. We'll need the radar to search for a landing site."

Arne never said he wished he had gone down with them, but he kept on with his questions till I thought he felt guilty.

Dropping into an orbit that grazed the atmosphere, they sowed the planet with life-bombs, heat-shielded cylinders loaded with seed pellets. Clearing weather over east Africa revealed a narrow sea in the Great Rift Valley, which had deepened and opened wider. Tanya wanted to land there.

"The most likely spot we've seen. It should be warm and wet enough. The water looks blue, probably fresh, with no great pollution. Besides, it happens to be near where Homo sapiens evolved. A symbolic spot for a second creation, though Pepe says I'm crazy to think about it."

"He says our job is already done. We've scattered seed over every continent and dropped algae bombs into all the major oceans. He says nature can take care of the rest, but I'm the biologist. I want soil and air and water samples to save for the next generation."

"Arne ought to be here." She was serious, with no sarcasm. "He's the terraformer, more expert than we are. He's missing the thrill of his life."

Elation bubbled in her voice.

"We feel like gods. Descending to the dead world with the fire of life. Pepe says we ought to head back to the Moon while we can, but I won't—I can't—give up the actual landing."

Beginning the final descent on the other side of Earth, they were out of contact while I bit my nails for an hour.

"Down safe!" She was exuberant when we heard her again. "Pepe set us down on the west shore of this Kenyan sea. A splendid day with a high Sun and a great view across a neck of the water to a wall of dark cliffs and the slopes of a new volcanic mountain almost as tall

Dropping into an orbit that grazed with life-bombs, heat-shielded

as Kilimanjaro. A tower of smoke is climbing out of the cone. The sky above us is blue as the sea, though maybe not for long. I see a storm cloud rising in the west."

She was silent for a moment.

"Another thing—a very odd thing. Landing on its tail, the plane stands tall. From the cockpit we can see far out across the sea. Most of it calm, there's an odd little patch of whitecaps. Odd because they're moving toward us, with no sign of wind anywhere else."

"I can make out—"

Her voice broke off. I heard the quick catch of her breath and Pepe's muffled exclamation.

"Those whitecaps!" Her voice came back, lifted sharply. "Not whitecaps at all. They're something—something alive!"

She must have moved away from the microphone. Her voice faded, though I made out a few words of Pepe's.

"... impossible... nothing green, no photosynthesis, no energy for our kind of life... we've got to know..."

I caught no more till at last Tanya was back at the mike.

"Something swimming!" Her voice was quick and breathless. "Swimming at the surface. We can't see much except the splashing, but it must have descended from something that survived the impact. Pepe doubts that any large creature could live with so little oxygen, but anaerobic life did evolve on the old ocean floors. The black plumes, the giant tube worms, the bacteria that fed them—"

I heard Pepe's muted voice. The mike clicked, went dead, stayed dead while Dian and Arne came up to listen with me.

"Something has cut them off!" Dian shuddered. "An attack by those swimming things?"

"No way to know, but I did try to warn them." Arne must have repeated that a dozen times as the hours went by. "The planet simply isn't ready for us. It may never be."

In the hangars we had a dozen spare space planes that had ferried freight or workmen to the Moon. I suggested that we should think of a rescue flight.

"We'd be fools to go." Arne shook his head. "If they need help, they need it now, not next week. Our duty is to stay here, gather the data we can, record it for a generation that may have a better chance."

"I'm afraid," Dian whispered. "I wish—"

"Wish for what?" Arne snapped. "There's nothing we can do. Nothing but wait."

We waited forever, till the mike clicked at last and we heard Pepe.

"Navarro here, on board alone. Tanya's been off the plane for hours. In her breathing mask, collecting whatever she can. I've begged her to come back before her air runs out, but she's fascinated with those swimmers. We watched one crawling up out of the water. Something like a red octopus, though she says it looks no kin to any octopus that ever existed before the impact. A mass of thick, blood-red coils. It splayed itself on the beach and lay still in the sun."

"She wondered if it might have some kind of photosynthetic symbiote in its blood. Something red instead of green, that feeds it on solar energy. I don't see any way for her to tell, but she's still out there with her binoculars and her video and her sample bucket."

"I've begged her to get back with what she has, but she always needs a few more minutes. She keeps working toward the beach. The red things are amphibians, she says. A dozen of them out there now. An unexpected life form that she thinks could be a problem later. Leave that for later, I told her, but she keeps slogging on. The beach

is mud, silt washed down off the hills in the west. She says the things are digging in it, maybe for something they eat. She wants to see. "But now—"

His voice lifted and stopped while he must have been watching. I heard no more till it came back, still begging her. She had gone too far. The mud was deeper than it looked. Her air had run low. She could watch the creatures from the cockpit till she knew them better. Faintly, I caught her answer.

"Just one more minute."

For a long-seeming time I heard nothing at all.

"One more minute." He echoed her words.

"It's close to night. That storm's rolling down on us. The wind's getting up. A few raindrops already—Stop, Tanny! Stop!" His voice went high. "Mind the mud."

"Give me just another minute." Her radio voice, so faint I hardly heard it. "These creatures—they're a new evolution. We've got to know what they are. Never mind the risk."

"I mind it," he called again to her. "Tanny, please—"

He stopped to hear something from her that I failed to catch. For a time he was silent again, except for the rush of his rapid breath.

"Navarro again." His voice was back, bitterly resigned. "She can't resist those red monsters. At first they sprawled flat, soaking up the Sun, but now they're moving. One jumped at another. The other dodged and sprang to meet it. Now—"

He stopped to watch and shout another warning.

"The things are really quite a show. They look legless, maybe boneless, but amazingly active and quick. A riddle, if they need no oxygen. But I wish—"

He yelled again, and waited.

"They're a crazy tangle of long red tentacles roiling the mud. Fighting? Mating? She has to know. Binoculars now, then the camera. She's too close. Getting data, but I don't like this mud. Maybe bottomless, with no plant life to hold it. Her feet are sinking in it. She's stumbling, struggling—"

"My God!" He was screaming into the microphone. "Hold still! I'm coming."

"Don't!" Her voice came thinly, desperate yet oddly calm. "Arne, please! Get back to the Moon. Report what you can. Don't mind me. There'll be another clone."

I heard the whirl and clang of the lock, and then nothing at all.

(5)

THE THREE OF US LEFT AT TYCHO LIVED OUT OUR NATURAL LIVES with no more news from Earth. The robots slept again, a million years perhaps; we had no clocks that ran so long. The computers woke them when the sensors found the Earth grown green enough. We grew up again, listening to the robots and the holos, struggling once more to learn the roles we must play.

"Meat robots!" Arne was always the critic. "Created and programmed to play God for old DeFalco."

"Hardly gods." Tanya was bright and beautiful and sure of nearly everything. "But at least alive."

"Meat copies." Arne mocked her. "Copies of the holo ghosts in the tank."

the atmosphere, they sowed the planet
cylinders loaded with seed pellets.

"More than copies, too," Tanya said. "Genes aren't everything. We're ourselves."

"Maybe," Arne muttered. "But still slaves of old DeFalco and his idiot plan."

"So what?" Tanya wore a thick sheaf of sleek black hair, and she tossed it scornfully back. "It's the reason we're here. I expect to do my bit."

"Maybe you, but I've heard my father talk."

We all knew his father's image in the tanks. A bronze-bearded giant, Dr. Arne Linder had been a distinguished geologist back before the impact. We'd read his books in Dian's library.

Born in old Norway, he had married Sigrid Knutson, a tall blonde beauty he had known when they were children. We learned more about his life from Pepe Navarro's journal. The warning caught them in Iceland. Flying back to the Moon base, he begged Navarro to drop him off in Washington, where his wife was a translator in the Norwegian Embassy.

He had left her pregnant, their first child due. He felt frantic to be with her, but Navarro said they had no time to stop anywhere. They fought in the cockpit. Navarro knocked him out and got them to the base in time to save their lives.

"Dreadful for him," Dian said. "He never got over grieving for Sigrid, or feeling he had failed her."

Our new Arne must have caught something of that bitterness. While the greener Earth had always beckoned the rest of us back to finish our mission, he had never learned to like it. Even as a child, he used to haunt the dome, scowling through the big telescope.

"Those black spots." He used to mutter and shake his head. "I don't know what they are. I don't want to know."

They were dark gray patches scattered here and there across all the continents. The instruments showed only naked rock and soil, bare of life.

"Only old lava flows, most likely," Tanya said.

"Cancers." He muttered and shook his head. "Cancers in the green."

"A silly notion," she scolded him. "We'll find the truth when we land."

"Land there?" He looked sick. "Not if I can help it!"

Our holo parents had been too long in the computers for such matters to concern them, but they were real enough to us. My father had been a journalist, reporting from all over the world. His videos of the monuments and history and culture of Russia and China and the old America held an eerie fascination, yet they always filled me with a black regret for all we could never recover.

He never spoke much about himself, but I found more about him from a long narrative, an odd mix of fact and fiction, that he had dictated to the computer. He called it *The Last Day*. Writing for a future he hoped might want to know about the past, he spoke about his family and everybody he had known, telling what they had meant to him. That much was the fact. The fiction was the way he imagined their last moments.

One chapter was about Linder's wife. Best man at their wedding and dancing with her at the reception, he felt haunted by her tragedy. The baby had come, he imagined, while Linder was in Iceland. She was already at home from the hospital, trying to reach him with her news, when DeFalco called on that last morning.

Although he told her nothing about the falling asteroid, his haste and his tone of voice alarmed her. She tried and tried again to reach Linder at his hotel in Reykjavik. He was never there. Frantic, she tried to call friends at the White Sands Moon Base. The phone lines were jammed.

Listening to the radio, watching holo stations, she learned of the communications blackout spreading over Asia. The baby sensed her terror and began to cry. She nursed it and crooned to it and prayed for Arne to call or come home. When the holo phone rang, it was a

friend in flight operations at White Sands, who thought she would be relieved to know her husband was safe. She had just seen him rushing aboard the escape plane.

She must have felt relief, my father thought, but also dreadful despair. She knew she and the baby were about to die. Trying not to feel that he had betrayed her, she prayed for him. With the wailing baby in her arms, she sang to it and prayed for its soul till the surface shock brought the building down upon them.

Hearing the emotion in my father's voice, I shared something of his sorrow, a grief that always left me whenever we climbed into the dome to see the reborn Earth and talked of how to restore it. Our instruments revealed nothing of those anomalous creatures Wu and Navarro had seen crawling out into the Sun. The depleted oxygen had been replenished. Spinning its swift days and nights high in our black sky, Earth waxed and waned through our long months, inviting us home with green life splashed over the land.

Identical genes never made us entirely identical. We all had to struggle for some compromise between ourselves, our genes, and the demands of our mission. I was never my clone brother, whose dried and frozen body had lain in the Moon dust below the crater wall almost forever.

Reading his letters to me about his frustrated devotion to Tanya, I felt it hard to understand. Grown up again, she loved the mission the way her mother had. Avoiding any risk of discord, she favored all three of us equally, Pepe, Arne, and I. If Dian felt hurt, she gave no sign.

"Arrogance!" Arne's clone brother had written in his diary. "Anthropocentric arrogance. 'We've found a new biocosm already blooming. We have no right to harm it. A crime worse than genocide.'"

The new

ARNE SHRUGGED WHEN I ASKED what he thought of that passage.

"Another man writing, too long ago. I get his point about the mission, but I'll do what I must. Frankly, I don't get what he said about Dian, if they really were in love. All she cares about now is her dusty books and her frozen art and chess with her computer."

DeFalco's clone should have been our leader, but he had died without a clone. When the time had come for our return, Arne gathered us in the library reading room to plan it.

"First of all," he asked, "why should we go back?"

"Of course we must," Tanya spoke sharply, irked at him. "That's the reason we exist."

"An overblown dream." His nose tilted up. "Old DeFalco's impact was not the first. It won't be the last. Maybe not the worst. But a new evolution has always replaced the old with something probably better. Nature working as it should. Why should we meddle?"

"Because we're human," Tanya said.

"Is that so great?" He sniffed at her. "When you look at the old Earth, at all the wanton savagery and genocide, our record's not so bright. Navarro and Wu found a new evolution already in progress. It could flower into something better than we are."

"Those red monsters on the beach?" She shuddered. "I'll go with our own kind."

Arne looked around the table and saw us all against him.

"If we're going back," he said, "I'm the leader. I understand terraforming."

"Maybe." Tanya frowned. "But that's not enough. We'll have to get down into low orbit and make a new survey to select the landing site. Pepe is the space pilot." She smiled at him. "If we make a safe landing, we'll have things to build. Pepe is the engineer."

We voted. Dian raised her hand for Arne, Tanya for Pepe. When that left me to break the tie, I nominated Tanya. Arne sat scowling till he

The baby sensed her terror and began to cry.

surrendered to her smile. Voting on the landing site, again we chose the coast of that same inland sea. Pepe picked the day. When it came, we gathered in space gear at the spaceport elevator. Only three of us at first, anxiously eager, impatiently waiting for Arne and Dian.

"She's gone!" Arne came running down the passage. "I've looked everywhere. Her rooms, the museum, the gym and the shops, the common rooms. I can't find her."

(6)

THE ROBOTS FOUND HER IN HER SPACESUIT A THOUSAND FEET down the crater's inner wall. She had struck jagged ledges, bounced and rolled and struck again. Blood had sprayed the faceplate, and she was stiff as iron before they got her back inside. Arne found a note in her computer.

"Farewell and good fortune, if any of you miss me. I've chosen not to go because I see no useful place for me at the Earth outpost, even if you get one set up. I lack the hardihood for pioneering. Even at the best, the colonists will have no time or need for me before another crop of clones can grow."

"Hardly true." Gravely, Pepe shook his head. "The mission will take us all."

The robots dug a new grave in the plot of rocks and dust outside the crater where our parents and our older siblings had lain so long; beside them the sad little row of smaller mounds that covered my beagles. We buried her there, still rigid in her space gear. Arne spoke briefly, his voice hollow and somber in his helmet.

"I do miss her. It's a terrible time for me, because I think I killed her. I've read the diaries of ourselves in love. I think she loved me again, though she never told me, or said much to anybody. Perhaps I should have guessed, but I'm not my brother."

"We'll have another chance." Tanya tried to comfort him. "But we can't help what we are."

We watched the robots fill the grave and delayed the launch again while he made a marker to set at the head of it, a metal plate that should stand forever here on the airless Moon, bearing only this legend:

DIAN LAZARD
NUMBER THREE

"Three." His voice in the helmet was a bitter rumble. "Numbers. That's all we are."

"More than that," Tanya protested. "We're human. More than human, if you remember why we're here."

"Not by choice," he grumbled. "I wish old DeFalco had left my father back on Earth."

Muttering and swallowing whatever else he wanted to say, he knelt at the foot of the grave. The rest of us waited silently, isolated from one another in our clumsy armor. Shut up in her own tiny world, Dian had seemed content with the precious artifacts she cared for. I felt sad that I had never really got to know her.

Arne rose from his knees and Tanya led us from the cemetery to the loaded plane. Our five individual robots had to be left on the station, but the sixth, the one DeFalco had not lived to program, came with us. We called it Calvin.

From orbit, we studied those dark blots again and found them changed.

"They've moved since we were children," Arne said. "Moved and grown. I don't like them. I don't think the planet's ready for us."

"Ready or not," Tanya grinned and leaned cheerfully to slap his back, "here we go."

"I can't imagine—" Muttering, he scowled at the ulcerated Earth. "What could they be?"

"Bare lavas, maybe, where the rains have left no soil where anything could grow?"

"Do bare lavas move?"

"Maybe burns?" She waited for her turn to study the data. "The spectrometers show oxygen levels high. More oxygen could mean hotter forest fires."

"No smoke." He shook his head. "Fires don't burn for years."

"Let's go on down."

She had Pepe drop us into a landing orbit above the equator. Low over Africa, we found the Great Rift grown still wider. That inland sea had risen, flooding the ancient shore, yet she decided to land near it.

"Why?" Arne demanded. "Have you forgotten those monsters on the beach?"

"I want to see if they've evolved."

"I don't like that." He nodded at the monitor. "That black area just west of the rift. I've watched it creeping across central Africa, erasing what I think was dense rain forest. Something ugly!"

"If it's a challenge, I want to cope with it now."

She had Pepe set us down on the bank of a new river, just a few miles from that narrow, cliff-walled sea.

We rolled dice to be first off the plane. Winning with a six, I opened the air lock and stood a long time there, staring west across the grassy valley floor to a wall of dark forest till Tanya nudged me to make room for her.

Pepe stayed on the plane, but the rest of us climbed down. Tanya picked blades from the grass at our feet and found them the same Kentucky Blue she and Pepe had sowed so long ago. When we looked through binoculars, however, the forest was nothing they had planted. Massive palm-like trees lifted feathery green plumes and enormous trumpet-shaped purple blooms out of a dense tangle of thick crimson vines.

"A jungle of riddles," Tanya whispered. "The trees could be descended from some cactus species. But the undergrowth?" She stared a long time and whispered again, "A jungle of snakes! Slick red snakes!"

I saw them at last, when she passed the binoculars to me. Heavy red coils, rooted in the ground, they wrapped the black stalks of things that looked like gigantic toadstools. Writhing like actual snakes, they kept striking as if at invisible insects.

"A new evolution!" Tanya took the glasses back. "Maybe from the swimmers we saw on that beach? Maybe red from mutant photosynthetic symbiotes? I want a closer look."

"Don't forget," Arne muttered. "Closer looks have killed you."

We saw nothing else moving till Pepe's radio voice came from the cockpit, high above us. "Look north! Along the edge of the jungle. Things hopping like kangaroos. Or maybe grasshoppers."

We found a creature venturing warily over a ridge, standing tall to look at us, sinking out of sight, hopping on toward us to stand and stare again, rumbling with something like the purr of a gigantic cat. A biped, it had a thick tail that balanced its forequarters and made a third leg when it stood. Others came slowly on behind it, jumping high but pausing as if to graze.

"Our retrojets must have scared everything away," Pepe called again. "But now! Farther up the slope. A couple of monsters that would dwarf the old elephants. Half a dozen smaller, maybe younger."

"A danger to us?" Arne called uneasily.

"Who knows? The big ones have stopped to look. And listen, too. They've spread ears as wide as they are. They do look able to smash us if they like."

"Shouldn't we take off?"

"Not yet."

Arne had reached for the binoculars, but Tanya kept them, sweeping the forest edge and the riverbank and the herd of hopping grazers.

"A wonderland!" She was elated. "And a puzzle box. We must have slept longer than I thought, for all this evolutionary change."

Arne climbed back into the plane and came down with a heavy rifle he mounted on a tripod. He squinted through the telescopic sight, waiting for the monsters.

"Don't shoot," Tanya said, "unless I tell you to."

"OK, if you tell me in time."

He held the rifle on them till they stopped a few hundred yards from us. Armored with slick purple-black plates that shimmered under the tropic Sun, they looked a little like elephants, more like military tanks. The tallest came ahead, spread its wing-like ears again, opened enormous bright-fanged jaws, bellowed like a foghorn.

Arne crouched behind his gun.

"Don't," Tanya warned him. "You couldn't stop them."

"I've got to try. No time to take off."

He kept the gun level. We watched those great jaws yawning wider. A thunderous bellow scattered the hoppers. She caught his shoulder and pulled him away from his weapon. The monster stood there a long time, watching us through huge, black-slitted eyes as if waiting for an answer to its challenge, till finally it turned to lead its family on around us and down to the river. They splashed in and disappeared.

"Nothing I expected." Tanya stood frowning after them. "No large land animal could have survived. Perhaps a few sea creatures did. The whales were prehistoric land dwellers that migrated into the sea. Maybe they've returned as amphibians."

The alarmed hoppers settled down. Tanya had us stand still in the shadow of the plane as they grazed in toward us, till Pepe shouted again.

"If you want a killer, here it comes!"

The hopper leader stood tall again, with a kind of purring scream. The grazers reared and scattered in panic. Something swift and tiger-striped pounced out of the grass and darted to overtake a baby before it could leap again. Arne's rifle crashed, and the two tumbled down together.

"I told you," Tanya scolded him. "Don't do that."

"Specimens." He shrugged. "You ought to take a look."

He stayed on guard with the gun while I went on with her to study his kills. No larger than a dog, the infant hopper was hairless, covered with fine gray scales, its belly torn open and entrails exposed. Tanya spread the mangled body on the grass for my camera.

"It's well shaped for its apparent ecological niche, but that's about all I can say." She shook her head in frustration. "We must have had a hundred million years of change."

The killer was a compact mass of powerful muscle, clad in sleek black fur. She opened its bloody jaws to show the fangs to my camera, had me move the body to show the teats and claws.

"A mammal." She spoke for the microphone. "Descended perhaps from rats or mice that somehow got through alive."

Still aglow with the elation of discovery, she forgave Arne for his kill.

"A new world for a new race!" she exulted.

"Maybe," Arne muttered. "But ours? More likely a brand new biology, where we'll never belong."

"We'll see." She shrugged and looked around again at the sea where the great amphibians lived and the jungle that had bred the killer. "We're here to see."

She set the robot to scraping soil from the top of a rocky knob to level a site for our lab and living quarters. We unloaded supplies and set up the first geodesic dome. The robot began cutting stone for a defensive wall. She took me on short expeditions along the shore and up the ridge to record the flora and fauna we found. She was soon asking Pepe about fuel for the plane.

"The reserve still aboard might get us back to the Moon, with half a drop left in the tanks."

"With only one aboard?"

"Safe enough."

"Then I want you to go back for what we need to replant our own biocosm. Seed, frozen eggs and embryos, equipment for the lab."

"To replant ourselves?" Arne scowled at her. "With that black biocosm just over the ridge?"

She shrugged. "We face risks. We must cope when we can. Leave our records when we can't." She turned to me. "You'll go back with Pepe. Holograph the data we can send you. Hold the fort."

"And leave us marooned?" Arne went pale. "Just the two of us?"

"Pepe will be back," she told him. "You have enough to do here. Testing soils. Prospecting for oil and ores we'll need."

Pepe and I went back to the Moon. My beagle was happy to have me home. The robots loaded and refueled the plane. Pepe took off and left me alone and very lonely. The robots were poor companions and the holos had nothing new to say, but Spaceman was a comfort until I got news from Earth.

Pepe had inflated another geodome for a hydroponic garden. Arne surveyed land for a farm. When the rainy season ended, the robotic Calvin built a diversion dam to draw irrigation water from the river.

"Arne enjoys shooting a yearling jumper when we need meat," Tanya reported. "A tasty change from the irradiated stuff we brought from the Moon. The hippo-whales come and go between the river and the grass. They stopped twice to stare and bellow, but they ignore us now. I think our tiny human island really is secure, though Arne still frets about the black spot. He's gone now to climb the western cliffs for a look beyond the rim."

Her next transmission came only hours later.

"Arne's back." Her voice was tight and quick. "Exhausted and in panic. Something chased him. A storm, he calls it, but nothing we can understand. A cloud so dark it hides the sun. A roar that isn't wind. Something falling that isn't rain. He says our days on Earth are done."

(7)

THE MONITOR WENT BLANK. ALL I HEARD WAS STATIC. OUTSIDE THE dome Earth hung full in the lunar night. I watched Africa slide out of sight, watched the black-patched Americas crawl through an endless day, watched Africa return, heard Tanya's voice.

"We're desperate."

Her face was drawn haggard and streaked with something black. In the window beyond her head, I saw a dead black slope reaching up to the dark lava flows that edged the rift valley.

"The bugs have overwhelmed us." Her voice was hoarse and hurried. "Bugs! They're what made those blighted areas that always worried Arne. You must preserve the few facts we've learned."

"These marauding insects have evolved, I imagine, from mutations that enabled some locust or cicada to survive the impact. Evidently they now enter migratory phases like the old locusts. A strange life cycle, as I understand it. I believe they're periodic, like the 17-year cicada."

"They must spend decades or even centuries underground, feeding on plant roots or juices. Emergence may be triggered when they've killed too many of their hosts. Emerging, they're voracious, consuming everything organic they reach and then migrating to fresh territory to leave their eggs and begin another cycle."

"Their onslaught on us was dreadful. They blackened the sky. Their roar became deafening. Falling like hail, they ate anything that had ever been alive. Trees, brush, grass, live wood and dead wood, live animals and dead. They coupled in their excrement, buried their eggs in it, died. Their bodies made a carpet of dark rot. The odor was unendurable."

"We're safe in the plane, at least for now, but total desolation surrounds us. The bugs ate our plastic geodomes. They ate the forest and the grass. They killed and ate the hoppers, bones and all. They shed and ate their wings. They died and ate the dead. They're all gone now. Nothing alive but their eggs in the dust, waiting for wind and water to bring new seed from anywhere to let the land revive, while they hatch and multiply and wait to kill again."

"Dark dust rises when the wind blows now, bitter with the stink of death. The hippos came out, wandered forlornly in search of anything to graze, and dived back in the river. Nothing alive is left in sight. Nothing but ourselves, in a stillness as terrible as their roar."

Something swift and
and darted to

"How long we can last, I don't know. Arne wanted to give up and get back to the Moon, but there's no fuel for that. We aren't equipped for any long trek across this devastation, but Pepe has ripped metal off the plane and welded it into a makeshift boat. If the bugs didn't get across the sea, perhaps we can make a new start beyond it.

"The plane must be abandoned, with our radio gear. This will be our last transmission. Keep your eye on the Earth and record what you can.

"And Dunk—" With a catch in her voice, she stopped to wipe at a tear. "I couldn't wish you were with us, but I want you to know I miss you. Next time, whenever that comes, I hope to know you better. As Pepe likes to say, *Hasta la vista!*"

1,000

YEARS AFTER, WE'VE BEEN REBORN TO TRY again. Much of Earth is still darkly scarred, but those dark spots are gone from Africa and Europe. We're going down to Earth, all five of us, with a cryostat filled with seed and cells to replant the planet if we must. Dian is bringing a few of her precious artifacts on the narrow chance we find anybody apt to care.

We're landing on the delta of the Nile. It drains into the Red Sea now, but its valley is still a vivid green slash across red-brown desert. Pepe has picked a landing spot a little north of where the pyramids stood. We're overloaded. Pepe thinks we'll have to spend so much fuel on survey and landing that we can't come back, but we're prepared to stay. I'll record more detail as we drop out of low orbit.

"Technology!" Pepe's shout of triumph rang from the cockpit on our first pass above the Nile. "They've got technology. I heard radio squeals and whistles, and then a burst of weird music. I think our job is done."

"If it is—" Dian was at the telescope, but I heard the awed words she murmured almost to herself. "A new world ready to welcome us!"

"Maybe." Waiting uneasily for a turn at the telescope, Arne shook his head. "We haven't met them yet."

"Maybe?" Pepe mocked him. "We came to meet them, and I think they'll have enough to show us. I see bright lines across the ancient delta. Some run all the way to the river. Canals, I imagine. And—"

His voice caught.

"A grid! There on the western edge. A pattern of closer lines. Could be the streets of a city." He was silent as Earth rolled under us. "Buildings!" His voice lifted suddenly. "It is a city. With the Sun shifting, I can make out a tower at the center. A new Alexandria!"

"Try for contact," Tanya told him. "Ask for permission for us to set down."

"Down to what?" Arne frowned. "They didn't ask us here."

"What's the risk?" Dian asked him. "What have we got to lose?"

Pepe tried when we came around again.

"Squeals." Frowning in the headphones, he made a face of wry frustration. "Whistles. Scraps of eerie music. Finally voices, but nothing I could understand."

"There!" Tanya was at the telescope. "Out in the edge of the desert, west of the city. A pattern like a wheel."

He studied it.

"I wonder—" His voice paused and quickened. "An airport! The wheel spokes are runways. And there's a wide white streak that could be a road into the city. If we knew how to ask—"

"No matter," she told him. "We've no fuel to search much farther. Put us down, but out where we won't make a problem."

On the next pass, we glided down. The city roofs raced beneath us. Red tile, yellow tile and blue, aligned along stately avenues. The airport rushed beneath us. We were low above the tall control tower when I felt the heavy thrust of the retrorockets.

We tipped down for a vertical landing. The thundering cushion of fire and steam hid everything till I felt the jolt of landing. The rocket thrust gone, we could breathe again. Tanya opened the cabin door to let us look out.

The steam was gone, though I caught its hot scent. I rubbed the sun dazzle out of my eyes and found clumps of spiny yellow-green desert brush around us. The terminal building towered far off in the east. We stayed aboard, uneasily waiting. At the radio, Pepe got hums and squawks and shouting voices.

"Probably yelling at us." He twirled his knobs, listened, tried to echo the voices he heard, shook his head again. "Could be English," he mustered. "Angry English, from the sound of it, but I can't make anything out."

We sat there under the desert blaze till the plane got too hot for comfort.

"Will they know?" Arne shrunk back from the door. "Know we brought their forefathers here?"

"If they don't," Tanya said, "we'll find a way to tell them."

"How?" Sweating from more than the heat, he asked Pepe if we could take off again.

"Not for the Moon," Pepe said. "Not till we must."

Tanya and I climbed down to the ground. Spaceman came with us, running out to sniff and growl at something in the brush and slinking back to tremble against my knee. Arne followed a few minutes later, standing in the shade of the plane and staring across the brush at the distant tower. A bright red light began flashing there.

"Flashing to warn us off," he muttered.

I had brought my videocam. Tanya had me shoot clumps of the thorny brush and then a rock matted over with something like red moss.

"Data on that crimson symbiote reported by the last expedition." She spoke crisply into my mike. "Apparently surviving now in a mutant Bryophyte—"

"Hear that?" Arne cupped his hand to his ear. "Something hooting."

What I heard was a pulsing mechanical scream. Spaceman growled and cowered closer to my leg till we saw an ungainly vehicle lurching over a hill and rolling toward us on tall wheels, flashing colored lights.

"Now's our chance," Tanya said, "to give them the gifts we've brought. Show them we mean no harm."

Clumsy under the heavy gravity we climbed back into the plane and came down with our offerings. Dian carried one of her precious books, the *Poems of Emily Dickinson*, wrapped in brittle ancient plastic. Arne brought a loudhailer, perhaps the same one DeFalco had used to warn the mob away from the escape craft. Pepe stayed in the cockpit.

"We come from the Moon." Arne pushed ahead of us to meet the vehicle, bawling through his hailer. "We come in peace. We come with gifts."

The vehicle had no windows, no operator we could see. Spaceman ran barking to meet it. Arne dropped the bullhorn and stood in front of it, waving his arms. Hooting louder, it almost ran over us before it swerved and rolled on around us to butt against the plane. Heavy

tiger-striped pounced out of the grass overtake a baby before it could leap again.

metal arms reached out to grab and tip it. Pepe scrambled out as it was lifted off the ground. The hooting stopped, and the machine hauled it away, while Spaceman whimpered and huddled against my feet.

"Robotic, I guess." Pepe stared after it, scratching his head. "Sent out to salvage the wreck."

Baffled and anxious, we stood there sweating. Flying insects buzzed around us. Some of them stung. Tanya had me get a closeup of one on my arm. A hot wind blew out of the desert west, sharp with a scent like burned toast. We started walking toward the tower.

"We're idiots," Arne muttered at Tanya. "We should have stayed in orbit."

She made no answer.

We plodded on, battling the gravity and swatting at insects, till we came over a rocky rise and saw the wide white runways spread out ahead, the tower at the hub still miles away. Parked aircraft scattered the broad triangles between the flight strips. A few stood upright for vertical landing and ascent, like our own craft, but most had wings and landing gear like those I knew from pictures of the past.

We dropped flat when a huge machine with silver wings came roaring overhead, stopped again when a silent vehicle came racing to meet us. Arne lifted his bullhorn and lowered it when Tanya frowned. Brave again, Spaceman growled and bristled till it stopped. Three men in white got out, speaking together and staring at him. He stood barking at them till one of them pointed something like an ancient flashlight at him. He whined and crumpled down. They gathered him up and took him away in the van.

"Why the dog?" Arne scowled in bafflement. "With no attention to us?"

"Dogs are extinct," Tanya said.

"Hey!" A startled cry from Pepe. "We're moving!"

The parked aircraft beside the strip were gliding away from us. Flowing without ripples, without a sound, with no mechanism visible, the slick white pavement was carrying us toward the terminal building. Pepe bent to feel it with his fingers, dropped to put his ear against it.

"A thousand years of progress since we came to fight the bugs!" He stood up and shrugged at Tanya. "Old DeFalco would be happy."

Scores of people were leaving the parked aircraft to ride the crawling pavement. Men in pants and skirt-like kilts. Women in shorts and trailing gowns. Children in rainbow colors as if on holiday. Although I saw nothing much like our orange-yellow jumpsuits, nobody seemed to notice. People streamed out of the terminal ahead. Most of them, I saw, wore bright little silver balls on bracelets or necklaces.

"Sir?" Arne called to a man near us. "Can you tell us—"

With a hiss as if for silence, the man frowned and turned away. They all stood very quietly, alone or in couples or little family groups, gazing solemnly ahead.

Pepe jogged my arm as we came around the building and into a magnificent avenue that led toward the heart of the city. I caught my breath and stood gawking at a row of immense statues spaced down the middle of the parkway.

"Look at that!" Arne raised his arm to point ahead. "I think they do remember us."

A woman in a long white gown gestured sternly to hush him, and the pavement bore us on toward a tall needle that stabbed into the sky at the end of the avenue. A thin crescent at its point shone like a bright new Moon. Statues, needle, crescent, they were all bright sil-

ver. A bell began to boom somewhere ahead, slow deep-toned notes like far thunder. The murmur of voices ceased. All eyes lifted toward the crescent. I saw Pepe cross himself.

"A ceremonial," he whispered. "I think they worship the Moon."

I heard him counting under his breath as the bell pealed. "Twenty-nine," he murmured. "The lunar month."

The soundless pavement took us on till he started and jogged my arm again, pointing at the towering figure just ahead. More than magnificent, a blinding silver dazzle in the slanting morning Sun, it must have been a hundred feet tall. Shading my eyes, I blinked and looked and blinked again.

It was MY FATHER. IN THE SAME JACKET AND necktie his holo image had worn when it spoke from the tank, flourishing the same tobacco pipe he had waved to punctuate his lectures. The pipe, I thought, could be only a magic symbol now; DeFalco had saved no tobacco seed.

Those nearest the statue dropped to their knees, kissing their lunar pendants. Eyes lifted, they breathed their prayers and rose again as we moved on toward the next monumental figure, even taller than my father's. It was Pepe himself, in the flight jacket and cap his clone father had worn to the Moon, one gigantic arm lifted as if to beckon us on toward the needle and the crescent. People pressed toward it, kneeling to kiss their pendants and pray.

"He never dreamed." His own eyes lifted, Pepe shook his head in awe. "Never dreamed that he might become a god."

Tanya came next, taller still, splendid in the sunlit shimmer of her lab jacket, raising an enormous test tube toward the tower. Arne next, waving his rock-hunter's hammer. Finally Dian, the tallest, holding a silver book. I heard our actual Dian gasp when she read the title cut into the metal.

The Poems of Emily Dickinson.

Below the needle and the crescent, the pavement carried us into a vast open circle ringed with great silver columns. Slowing, it crowded us together. At a single thunderous peal, people stood still, gazing up at a balcony high on the face of the spire.

A tiny-seeming man robed in bright silver appeared there, arms raised high. The bell pealed again, echoes rolling from the columns. His voice thundered, louder than the bell. The worshipers sang an answer, a slow and solemn chant. He spoke again, and Pepe gripped my arm.

"English!" he whispered. "A queer accent, but it's got to be English!"

The speaker stopped, arms still lifted toward the sky. The bell pealed, its deep reverberations dying slowly into silence. People around us fell to their knees, faces raised to the crescent. We knelt with them, all of us but Arne. He stalked on forward, bullhorn high.

"Hear this!" he bawled. "Now hear this!"

People around him hissed in protest, but he strode on toward the tower.

"We are your gods!" He paused to let his voice roll back from the columns. "We live on the Moon. We have returned—"

A tall woman in a silver robe came off her knees to shout at him, waving a silver baton. He stopped to gesture at Dian and the rest of us.

"Look!" he shouted. "You must know us—"

She waved the baton at him. His voice choked off. Gasping for breath,

When I tried to tell her we were visitors from the Moon, she scolded and seemed to pity me.

he dropped the bullhorn and crumpled to the pavement. The woman swung the baton toward us. Dian rose, waving her book and declaiming Dickinson:

*This is my letter to the world
That never wrote to me—*

Dimly, I recall the desperate quaver in her voice, the hushed outrage on the woman's face. The baton swept us. A puff of mist chilled and stung my cheek. The pavement seemed to tilt, and I must have fallen.

(8)

FOR A LONG TIME I THOUGHT I WAS BACK AT TYCHO STATION, confined to the bed in our tiny clinic. A robot stood over me, as patiently motionless as any robot. A fan hummed softly. The air was warm, with an odd fresh scent. I felt a sense of groggy comfort till a numb stiffness on my cheek brought recollection back: that avenue of gigantic silver figures, the stern-faced women in her silver robe, the icy mist from her silver baton.

Shocked wide awake, I tried to get off the bed and found no strength. The robot tipped its lenses, bent to catch my wrist and take my pulse. I saw the difference then; its slick plastic body was the pale blue of the walls, though it had the half-human shape of our robots on the Moon.

Earth gravity turned me giddy. The robot eased me back to the bed and seemed to listen when I spoke, though its answer was nothing I could understand. When I stirred again, it helped me to a chair and left the room to bring a human physician, a lean dark man who wore a silver crescent on a neat white jacket. Briskly efficient, he listened at my heart, felt my belly, shook his head at what I tried to say, and turned to leave the room.

"My friends?" I shouted at him. "Where are they?"

He shrugged and walked out. The robot stood watching till I felt able to stand and then took my arm to guide me outside, into a circular garden ringed with a circular building. Its lenses followed intently while I walked gravel paths through strange plants that edged the air with scents new to me. The other doors, I thought, might be hiding my companions, but it caught my arm when I tried to knock. When I persisted, it drew a little silver baton clipped to its waist and beckoned me silently back into the room.

Under its guard, I was treated well enough. Although my words seemed to mean nothing, it nodded when I rubbed my lips and my belly, and brought a tray of food: fruits that we had never grown on the Moon, a plate of crisp brown nut-flavored cakes, a glass of very good wine. I ate with a sudden appetite.

Silent most of the time, now and then it burst into speech. Clearly, it had questions. So did I, desperate questions about these remote children of ours and what they might do with us. It listened blankly when I spoke and locked the door when it left the room, with no hint of any answers.

Haunted by our images along that monumental avenue, I slept badly that night, dreaming that they were lumbering in hot pursuit while we fled across a lifeless landscape pitted with deep craters those black insects had eaten into the planet.

Terror chilled me. Did these people want to sacrifice us in that sacred circle? Drown us in the Nile? Feed us to the insects? Freeze us into silver metal and stand us on guard against the next invasion of heretic clones? I woke up shivering, afraid to know.

Next morning the robot brought an odd-looking machine, and admitted a slim, quick little woman who looked a little like Dian, though she was wrinkled and dark from a sun that never shone below our Tycho dome. Perhaps a sort of nun, she wore a tall silver turban and fingered a silver Moon pendant. She set up the machine to project words on the wall.

*The moon is distant from the sea,
And yet with amber hands
She leads him, docile as a boy,
Along appointed sands.*

Familiar words. I'd heard Dian recite them in a tone of adoration,

though I was never sure exactly what they meant. They became stranger now, as the woman chanted them like a prayer. She repeated them two or three times in the same solemn tones and then read them more slowly, watching through dark-rimmed glasses to see my response, until at last I could nod to a spark of recognition. Vowel sounds had simply shifted. *Moon was mahan, see was say.*

She came back again and again, using her machine to teach me like a child. Even when the sounds became familiar, everything else was baffling: plants and animals, clothing and tools, maps of the world and the symbols of math. Yet at last I was able to ask about my companions.

"Uhl-weese." She frowned and shook her head.

Unwise. Why, she didn't say. When I tried to tell her we were visitors from the Moon, she scolded and seemed to pity me. Caressing her sacred pendant, she spoke of the paradise the Almighty Five had made of the Moon, where the blessed were allowed to dwell in an everlasting joy.

Paradise, unfortunately, was not meant for the likes of me. Pretenders who unwisely tried to steal sacred things or powers were to be consumed forever by the black demons in their hell beneath the earth.

In olden days, she told me darkly, divine fire might have descended to redeem my errant soul. In these more enlightened times, luckily for me, those who attempted to misuse the Holy Book were regarded as either psychotics in need of treatment or shysters deserving eternal torment.

She tried to save me with instruction in the lunar truth, drawn from a massive volume in silver boards that had theological footnotes to explicate almost every holy word. Dickinson's oriole had become the trickster god, Pepe, who cheated as he enchanted. Dian was not only the Moon Mother but also the soul who selected her own society of those who lived to earn their place with her in paradise. The book itself was her letter to the world that never wrote to her.

I was unconverted until one day when I was walking with the robot in the garden and stepped off the path to pick a purple flower. The robot said "Noot, noot," and took the flower from me, but it had failed to see me palm a little ball of crumpled paper. When I was able to spread it out in the privacy of my bathroom, it was a note from Tanya, written on a blank page torn from her notebook.

They want to think we're crazy, though they have trouble explaining how we got here in a sort of craft they never saw before. My witch doctor has a theory. He's trying to convince me that we came from South America, which has not yet been colonized. He talks of a lost party that set out a couple of centuries ago to fight the black insects there. The expedition seems to have ended with a crash into the Amazon rain forest in an area the insects were just invading. Rescue efforts failed, but he believes we must be descendants of survivors. He thinks we somehow salvaged or repaired the wrecked craft that brought us back. If we want to get out of here, I think we'd better go along.

I rolled the paper up and dropped it next day where I had found it. In the end we all went along, though Arne held out until Dian was allowed to persuade him. He grumbled bitterly till he found work on a Nile dredge, improving the channel and turning a swamp into new land for docks and warehouses. He says he is happier now than he ever was twiddling his thumbs on the Moon.

Although the ages seem to have erased every relic of our own times, these people are eagerly searching their own past for evidence of the Holy Clones. They have given Dian a museum position, where she can make good use of her skills at restoring and preserving antiquities and perhaps finally establish herself as an inspired interpreter of holy writ.

Pepe qualified for a pilot's license while Tanya studied methods for the control of the predatory insects. They are gone now with a new expedition to reclaim the Americas.

Although all the history I know is heresy, sternly outlawed here, I've found a university job as a janitor. It gives me access to radio equipment that can reach the lunar station. We can't help hoping that our own silver colossi will endure to watch this new Egypt grow into a finer civilization than our own ever was. Yet Tycho must be kept alive, lest disaster strike again. □

With presidential privacy being devoured
by the public's right to know,
the only things to suffer are the ratings.

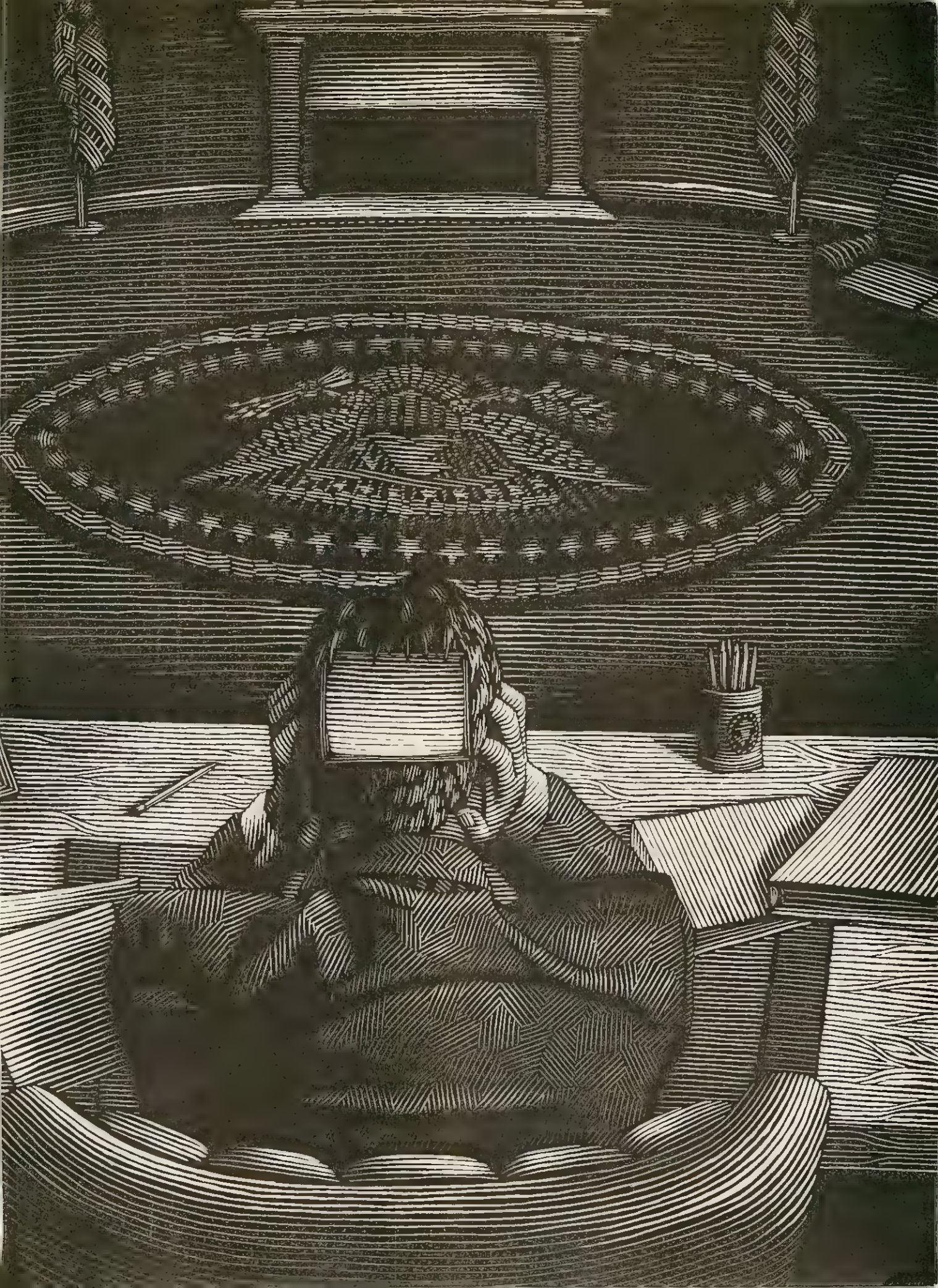
THE PRESIDENT'S CHANNEL

HOWARD AWOKE IN THE MIDDLE OF THE NIGHT AND COULD NOT go back to sleep. He looked at the bedside clock. 3:20. Jeanine lay solidly asleep beside him. After tossing and turning for a half-hour, envying his wife her equanimity, he got out of bed and headed for the kitchen.

He rummaged through the pantry until he found a bag of chocolate chip cookies, poured himself a glass of milk, and sat down at the table in the dark. The moonlight coming through the skylight softly illuminated the piles of bills at the corner of the table. He could make out the top one: \$1,100 for the monthly auto premium. The premiums had leaped up back in January when Holly had taken some automatic weapons fire from a van driver on the beltline.

BY JOHN KESSEL

ILLUSTRATION BY PATRICK ARRASMITH



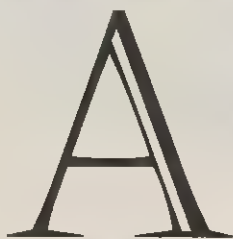
She was too young—only eight—to be driving, but she needed the after-school job if she was ever going to save up enough money to afford college. But she seemed more interested in boys; lately she'd taken to wearing fishnet stockings, and had shaved her eyebrows off and drawn them on a half-inch higher on her forehead. Howard blamed the sexy advertising from the companies that sponsored the 3rd grade.

He finished the last of the cookies without even realizing it. They had gone down as tasteless as silicone. Jesus—the company urine test was tomorrow! He turned the bag over to the list of ingredients, and squinted to read them in the faint light: DERACINATED SUGAR, PROCESSED RICE FLOUR, DRIED BEET PULP, POTASSIUM CHLORIDE, PARTIALLY HYDROGENATED VEGETABLE SHORTENING, CALCIUM PROPIONATE, XANTHUM GUM, ARTIFICIAL COCOA SUBSTITUTE, INERT SYNTHETIC BULK MATERIALS NOT MORE THAN 30 PERCENT.

He supposed there was nothing there to set off any alarms. He drained his glass of milk. It tasted like water—Jeanine insisted on buying only ultra skim. She acted as if somehow, if she managed everything precisely, she would keep them alive forever.

The only way to live forever was to be rich. The problem was, in order to build up anywhere near the vast sum it would take to have his genes recapped, they would have to live like paupers. Or he could raid Holly's college fund. Maybe Holly would do well enough in school to get some kind of scholarship? Right. The last time he had dialed up her academic record, she was maintaining only a B+ average. Eighty percent of the kids in school had a B+ average. Kids who showed up to class twice a week and spent the other days hitting themselves in the head with hammers carried B+ averages. Holly was more interested in getting her ears lopped than in school.

She could get corporate backing. But indenturing his daughter to a multinational was not a hurdle he was ready to make himself leap. Yet. He still felt pretty good. As long as he could keep his job. Maybe they could win the lottery.



t this rate he would never get to sleep. He shuffled into the den and turned on the TV. The 46-inch screen lit and he flicked through the channels. Sportsnet was rerunning Round 16 of the perpetual NCAA Basketball Tournament. The Rage Channel had videos of people driving their cars off cliffs. He skipped past Sex

Over Eighty to a gab channel.

The Wowzers were complaining about increasing wirehead addiction. Trying to get a constitutional amendment against electricity.

Elizabeth Taylor was getting married again.

Congressman Grieve was calling for an investigation of the administration, claiming that NSA operatives were feeding made-up footage into government monitors to cover up their crimes.

The Commentary All-Stars dismissed the President's nonexistent sex life and brought on an oral hygienist, who critiqued the Chief Exec's spotty flossing and speculated what effect periodontal surgery might have on the upcoming budget negotiations.

Howard flipped around until he hit The President's Channel.

The screen showed an image of a hallway; Howard recognized it as the one outside the President's bedroom. It was 4AM, and President Richter was awake.

Howard wondered what had gotten the Pres up in the middle of the night. Some government crisis? His latest poll numbers? A guilty conscience? The Pres was humming a song, the tune of which was familiar, but Howard couldn't make it out. The President liked to hum to himself; that was one of the first things Howard had noticed back when Richter had been promoted from Vice Pres and had had the camera and mike surgically implanted in his head.

His predecessor Gerringer had snapped midway through his second term—gone on a month-long binge, betting campaign money on football games, feeling up the interns, mainlining speedballs. So Richter found himself in a job he had never signed up for. So far he had seemed a completely stolid nonentity, a punching bag for the opposition, a vending machine for the lobbyists. Deposit your coins and receive your treat. Gerringer had been edgy; Richter was plain dull. Ratings on his channel had plunged. For all Howard knew, he might be the only person in the country tuning in at this late hour.

The Pres moved through the Executive living quarters, down a hall and some back stairs. As he descended the stairs, Howard noted his clothing: He was wearing a wine-red robe and slippers. At the bottom of the stairs, the Pres poked his head around the corner, revealing a long view of a carpeted hall. A Secret Service man in a dark suit was stationed at the end of the corridor; the Pres jerked his head back, causing the image to spin dizzily.

Looked like Richter was finally going to do something interest-

THE ONLY
WAY TO LIVE
FOREVER WAS
TO BE RICH.

ing. Was he heading for some secret meeting? Maybe he had a rendezvous with his secretary, that Ms. Hodges? She wore short skirts and had long white legs.

The image of the hallway bounced as the Pres dashed across the corridor, through a swinging door to a dark room. He flipped on the light.

It was a kitchen. The Pres moved directly over to a stainless steel industrial refrigerator and took out a wheel of Camembert. From a cupboard he took a box of crackers, a bottle of red wine, a bag of tortilla chips, a box of graham crackers, three chocolate bars, and a bag of marshmallows. He cleared a spot on a stainless steel table, pulled up a stool, and began gorging himself.

Howard watched for another 15 minutes while the Pres put down half of the cheese, most of the wine, all of the chips. Watching the man raise the food toward the camera was like having food shoved at Howard through the television. By the time the Pres's hands were sticky with melted chocolate and marshmallows from the s'mores, Howard was feeling sleepy.

Pathetic bastard. No way he was going to get himself re-elected.

Howard turned off the TV. He looked in on Holly, who lay sleeping, her face scrubbed free of paint, her scowl relaxed, looking more like an eight-year-old than she ever did when she was awake. He pulled the covers up over her sprawl and shuffled back to the bedroom.

Jeanine stirred. "Are you okay?"

Howard kissed her on the forehead. "Compared to what?" □



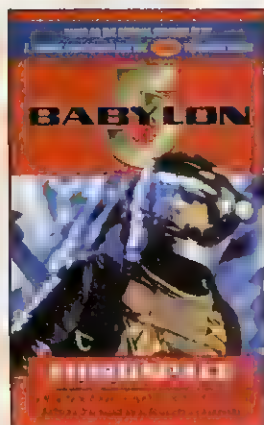
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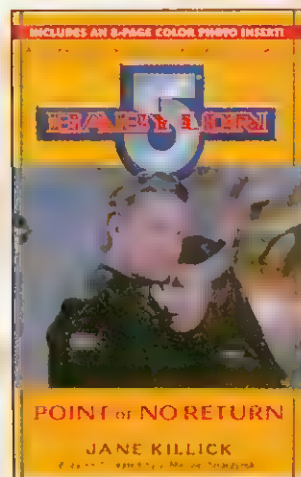
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Here Our

Steps FALTERED

When
surfing
the web
becomes
more than
just a
metaphor,
wipeouts
will be
murder.

THE WEB WAS BITSHAT: CRASHING AND nearly dead. Stuck on the local Spokane Net, Archie and I scrabbled at my screens, out of sheer boredom doing the livechat competitions of improvised verse. It was Archie's turn. He scrambled over me to gnash his teeth at the cam. Points for drama.

"The banks of the world totter," whined Archie, lips dry from espresso,

"Parasite worms suck their juices.

Reality's pharmacists

Charge their sheetgun dispensers

With steel-jacket pills,

To remedy the bright disease of hope.

BY DANA WILLIAM PAXSON
ILLUSTRATION BY RICK BERRY

On most ancient copper wires,
Booting us from recursions,
Comes the call."

A few claps. A girl said, "Yah, Archie, so what?"

He slumped, defeated. "It's real, Undine. No creds. No comm. No mu-bucks trickling in for the pubs. We're smoke in the air. Can you buy pizza?"

Rude of him, but true. No thanks to the banks, I was one of the few who could still bag a dinner off the lines, but I didn't tell anybody that. If Archie and the others knew, they'd suck me for all they could get. You live the lies you have to, and halve the truths that pay.

"Next," droned the moderator. Archie slapped the link down and turned to me.

"I didn't get my turn," I complained at him.

"You've got a message," he said, pointing at the fruit tree on screen. It drooped a peach.

I picked it before it fell, and cut it open with Occam's Hack. It was from Quinh Mai, trickling into Spokane, probably via the geosats. She spoke in Heroic Modenglish, a role-player tongue adopted by the digitals for formal transactions: money rode every word.

Her imago said, "Ali, the Economic Union turns to you. The cities are burning, and smoke from plastics chokes our lungs. Imaging is dead. The people everywhere starve in black rooms, blind and muffled. Assemble your forces and sweep the illness from the Web." Her singsong formal tone pulled me into responding the same way. As the words ended, her imago actualized; she came up live, her smooth face scarred by errors.

I swallowed my surprise, but not the old anger. "Ah. How will you pay me this time, Mai? Prison, and a sense-harness, and one favorite medication? Your Hanoi lice still gouge my skin." Where my helm's

"Watch your fiber. Wait and hope." I smiled; these had been her words to me, when she had turned me in to Fazio, far back when. But now I had more gold.

She frowned. "I must tell the Economic Union a date."

"Tell them I'll start today. I'll report more tomorrow after I've seen the traces." Comforting to know that I could dictate to the rich.

"Tomorrow." She cut off.

I tucked away my newly arrived treasures, and winged an Amber bird through my link to my captains. One by one they arrived on the green Hill of my Summoning, images slow and spastic on the Web now frail with illness.

"Ali, salaam." A squat Asian horseman, monstrous squint, steel fingernails: it was Van Zandt, who fungus-farmed his armpits on contract to Glaxo Wellcome; he lived in his dumpster in East Chicago, his glass brainthread up the nearest utility pole, snuff music screeching in his bloodstream. My standard bearer.

"We're getting the Horde together," I told him. "Call the tribes. For gold and guns."

"Gold and guns! Gold and guns! Shove it up the bankers' buns!" He vanished, laughing.

A cloud of pale smoke: Arthurine. "I expected this, Ali," she sulked. "Always in the middle of something good."

Her phrase for a man in front and a man in back. Her image humped and twisted, too thin to see clearly. "Arthurine. It pays well. Will you play?"

"Of course." Her image shook free its male veils, and stood tall and clear in full shingled armor, Japanese helm in hand, orange hair close-cropped. "They were boring me."

"You're 87—most things bore you. This won't. We're saving the world."

THE WORLD FLICKERED, BLEADED, TURNED AND EMBRACED US

circuits married the contacts at my temples, I scratched. "Archie, time to splat off. Sorry. Pizza later at Buckbill's."

"You're just pissed about your turn." He mumbled, fuck-saluted, gulped the last from his cup, and eased out past the cable tangle, rastering off. The door clicked shut.

Mai said, "You are the master, Ali. Name your terms, and we will meet them."

I gloated, mocking singsong. "Hah! Like last time? How will you grant assurance, with the banks fallen and the armies dictating to you?" I love talking Heroic; I'm an Arab, with a fatal attraction to inflection.

"I offer you their toys: gold and weapons. The first are at your door. Each day more will follow. Go and see." She smiled, dark eyes and smooth dark hair, long neck, ah.

And I looked outside, and saw that it was good, damn sure. Two seeker guns, a pair of five-hundred-gram gold bars, and a cracker engine straight from Pyongyang lay buried in the trash tub I used for mail deliveries. Over my Spokane neighborhood, the sky steamed black from frying furniture. A patch of blue peered between gray clouds withdrawn to the sky's heights above the fires. Back to the chair.

"I accept your request, conditionally of course on deliveries daily as today, and amnesty for crimes through the project's end. You have not alerted Fazio, I trust?"

"Fazio is dead."

The final metaphor. A great bird flapped mighty wings and raised its weight from my back. My psychiatric jailer, gone to snow? "How?"

"A parasite gene loaded him with serotonin. He crashed in Vienna."

"A fitting end for a doctor of words."

"Perhaps. When will you begin work?" Mai pressed, as always.

"Not again." By now she had her herbal tea heating in the tiny kitchen two hundred stories over Atlanta.

"Ali. We've been too long apart."

Another image stood by Arthurine, a lithe dark dancer with knives in his hands. Zvi. No doubt still pacing that West Jerusalem basement, where the stone never rotted, and plastic sheeting kept out the riot gas, and his glass neuron snaked the sewers to an uplink in the Holy Sepulcher's dome. We'd loved there in his hideaway, before Mai and Fazio . . .

I've loved them all, bits and bytes and bodies. I'm a Frenchman, fatally attracted à l'amour.

"Saving the world today," Arthurine told him.

"Excellent. And for dinner?" They stage-laughed, heads thrown back, mirthless teeth gleaming in wide mouths.

I plugged the glass bus of the cracker engine into my box. Instant flame, and a silver-shining dragon spoke. "Who disturbs me? Feed my fires." It opened its long-toothed maw, and waited.

"Oh!" said Arthurine and Zvi together. "A Korean crypto. Knotty, knotty."

"Ali!" Here was Jeanne, plain Jeanne. Image a tall woman in an ankle-length robe, sandaled feet, brown in skin and hair and eyes, a bouquet of deadly herbs in hand. "What is it?" She studied the dragon, chose a sprig of green, and reached out to feed the beast.

"Not yet," I said, and she withdrew her hand. "The minions of metaphor called on us. The Great Web is down. The EU staggers."

"I know. Here in Delhi the rain will not stop. Power fades, and the images flicker. In my alley, old men fight over coins again." There she was not Jeanne, but Amra, young and plump and dangerous with a blade.

"Call your friends. We are going to war." I imaged them the seeker guns and the shining bars; they smiled, nodded, and flicked away. A dozing dragon lay now alone on the Hill of my Summoning, while the grasses around it shimmered in the cyber winds.

I scanned. Everywhere, layers of metaphor slowly peeled away, endless paper onion husks falling from the dissolving Web. Here and there, bare pulses seethed, photons and electrons without animus or anima; context itself crisped, turned to empty silent ash. Without context, what is a bit? When the voltage on the line goes high, or low?

And which binary signal would Mai send me, the yes or the no, to trust or to betray? And how might it be reversed, to betray the trust, or redeem the betrayal? I wallowed in my ancient vinyl lounge, and scratched the corner of my eye where the Hanoi lice had built their home. I still loved her.

Pudgy from too much nothing, my gut complained. I stumbled up and off through nets of cabling to the shitter, then to the feed pipe. Empty the gut, fill it; connect, push in, ride the light, pop out; repeat. The shitter stank; I pumped it again, opened a hatch, slapped up the dustscreen, and savored the sulfur vapors in Spokane's unsweet air: forest factories burning.

The feed pipe whined, coughed, and spat a soft tube of pizza from Santamaria's. I shoved the mike aside, downed the pizza, wiped my face with the hardening tube, and ate the tube for dessert. It tasted like cookie—they stuck anise in them now. I sucked down a Frutta from the tank beside my chair, tightened down my helm and body senso, and went to work. Odd that the sensory harness didn't hurt any more.

WHEN THINGS BLOW BIG, I START SMALL. I PLUCKED A SCALY wisp of dying parchment from the bitridden air, and mounted Monsanto, my six-legged equus; he spread block-long chestnut wings and rose into eroding velvet. The sky arched sick and lossy, here in cyberland. Stars weakened and fell, fading.

"To the garden, quickly," I told Monsanto, and nudged him with a heel. The world flickered, blazed, turned and embraced us between riding hills, and we touched down where black soil seethed. Here I grew the herbs of compound logic; their cyber-chemistry distilled the metaphoric traces. Tiny jungle patches grew, flourished, mutated in seconds. I plucked three tiny seed pods from a slow hybrid of questions, squeezed them over a soft composted mound, and interred them there with the parchment scrap of death.

The black mound heaved and caved, and nothing remained of it but a hollow of sand.

"It's all sand anyway," said Monsanto, bending his long neck over my shoulder. His mane tickled my arm. "From sand it comes, and unto sand returns."

"Then metaphor is illusion. You do not exist."

My horse laughed at me. "Metaphor lies between the coming and returning."

"You are a foolish horse. If all is sand, then metaphor lies. Period."

"I am your spawn, Ali-Mahmud. The mirror makes no metaphors." He raised his head and neighed. "Your cohorts gather above us."

I squinted at the rotting sky as it grayed to indifference, or dawn, or the cracked ceiling of my Spokane hole, or all three. Van Zandt, Arthurine, Zvi, and Jeanne—Mongol, samurai, dancer, and shaman—stood along the barren ridge above my garden; behind them ranked their forces, motley in weapons and guise.

"When do we ride?" they called out.

I scooped the sand from my garden, mounted Monsanto, and landed beside Arthurine, holding the dead grains up for them to see. "Now. Here is the destruction. We must catch it just as it destroys, deep in time's cracks, where the photon heart beats, and metaphor germinates."

Van Zandt turned to his horde, and asked, "Who will ride the femto-second narrows?" And his mounted army vanished, except for seven.

Arthurine turned and called, "Ronin, who will walk this road thin as the blade's edge?" Four stood forth; the rest were gone into grayness.

Zvi spread his arms in question to his 10 companions, and 10 became three.

Jeanne stood alone.

The sky split at its edges, drying to brittleness. Lice itched at the rim of my vision. We were 19; how would we turn sand again to earth and heal the sky itself? The Web lay broken, cracking into grains. Monsanto folded his great wings and waited.

Van Zandt, restless as usual, broke the silence. "We ride. I take my warriors to Prague." They wheeled and vanished.

Jeanne said softly to me, "I would take your dragon."

"It is yours. Feed it carefully."

"You urge me. Hah." Her raised hand brought the dragon to her side. "Trust is binary, Ali." She departed in a hot draft of air and steam.

Arthurine announced, "We begin in Hokkaido, at the shrine of Hachiman in Kumaishi." Her ronin shouted with her, and they spun into a tornado thread rising out of sight.

Zvi said, "For us, Paraguay waits. Asuncion, and Colonel Freihof." With a graceful turn, he and his three shrank to a dot.

Jeanne's words reverberated in my head. I decided to tell the EU what we had seen. "Monsanto, take me to Quinh Mai." Without a word the great equus kicked into the fading air, and we rode.

MAI, IN FELINE GUISE, WAS UNHAPPY. "I AM TRACKED," SHE said, in cyberstreet shadows in Holocity Quatre. "Pale children follow me, ghosts from Finland and Estonia. If they see you, they will track you too. They multiply."

"Like the sickness?"

"Yes." Her shadowed face, catlike, nodded. "See? There." She extended a claw. Where she pointed, small sharp faces gave us weasel looks, and vanished. As I turned, surveying the vaguenesses in the doorways and niches, pale furtive figures slid from the edges of my vision. My lice itched.

"Why didn't you tell me?" Once again, she had trapped me in a sticky web—more spider than cat.

"They came after I contacted you. As if they were listening on my links." She drew closer, whispering to quadruple her encryption, "They bear signs of Fazio."

I recoiled. "But you said he was dead!"

"Quiet!" We glanced around, and three small figures retreated to an alley in darkness.

"How did you know they were from him?" I asked.

"I didn't. The signatures of scent resemble his, that's all. The signatures do not linger."

"His evolved sentis, then." A senti: a soliton-like resonance that carried its own intelligence across the Web. They had been illegal since 2096, 10 years ago, when some had overbred and flooded all the nodes and spines in Asia.

"Ali, be careful." Her tone wavered; the feline face looked down. "He told me about those things."

Anger came. "Yes, and much else, Little Cat. Did you tell him as much about me? or more?" My eye burned.

"You were not what you are now. Now—" she stopped abruptly, then choked out, "They are cutting in . . . my alpha lines are . . . Ali!" Her cat folded in on itself and rastered to zero.

I spun, flicked out a spray of waves in a full turn, caught three of Fazio's child sentis angling in at me, blew light at them, and delved electric bedrock. Someone had cracked the link that matched Mai's brain rhythms with her Web hitchpoint in Hué. If they distorted the sync signals just right, they would kill her. I would not let that happen.

I'm a Turk, fatally tough.

Monsanto was no rockdiver. I trolled strata, found a conduit flicking tattered signs, played soliton surfer, rose in Holobourg Vingt at a midnight pissoir. There my equus stood waiting, shaking flecks of diamond from his wings. "Hué hitchpoints, lightspeed," I said, jumping aboard.

"I'll put a girdle round the Earth," he said, and we flicked to a decaying railyard, its uneven and half-ballasted tracks spraying off into deep gloom in every direction. As I set foot on an embankment, it slid away into sand. Monsanto sank to his ankles, neighed in fear.

"Fly! Get away!" I shouted at him, struggling myself to stay upright. He arched his huge wings and fought, but the sand sucked him down, and as his metal-russet wings touched the railyard they shredded into dust. He screamed; his scream died to a final hiss, and he was gone.

The sand drew me in; I floundered to a rail and dragged myself up onto it. It sagged and twisted here and there, but lay intact enough to walk slowly, balancing; it was the cognate to an old copper wire through the dirt world. In the shadowed yard lay derailed strings of tankers, gondolas, and boxcars lying at crazed angles: wrecked transmissions. On the far side of the yard, a tall, thin figure in gray teetered on a rail: another signal-seeker like me.

The figure waved, beckoned; I turned toward it and felt my way along the rail humping and arching over sand gone fluid as the sea, stretching my legs past ties come loose from the rails and tossed like shipwreck jetsam. As we drew closer the figure resolved into a small Asian man of advanced age, jerkily battling to keep his balance. We faced each other on one tormented rail.

He beckoned again, and I edged closer. I wondered whether one of Fazio's sentis could do all this; the thought stopped me. He grinned and advanced. "Touch my hand," he said.

I drew back. Protocol. What or who was he? "Name?"

"Pham Duy," he said, smiling a little. He hummed a few bars of Ben Xuan, and said, "Here our steps faltered."

Words from the popular song he'd hummed; Pham Duy, the long-dead author. Quinh Mai had sung me those words when we'd first met in Hanoi. The old man was Mai's mask. I laughed for relief.

We touched fingers, code-spoke a rendezvous; no way to know who was listening in this open place.

"Are you okay?" I tried.

"Yes. The cuts missed my alphas."

"How about meeting at the third crypt?" This was Vault AT892 in Central North Dakota, part of a giant automated communications nexus built into an ancient ICBM silo.

"In four hours, spread-ess." Mai's figure held up three fingers.

"As you say." I held up five fingers, and we both bowed. Spread-S was the only way to go, seeding small trickles of bits across dozens of links in a Vernam-split FECC: virtually undetectable, impossible to eavesdrop, and error-free. We had to assume that enough links still lived to make it possible. And that the vault would be unwatched five hours from now.

Growing my wings and ascending, I missed Monsanto.

VAN ZANDT FLAGGED ME AS I PASSED THE PI REFLECTOR AT GeoSync W. Pi was loused, no doubt about it; Van Zandt's armpits glowed orange, his long nails rimmed with lime phosphorescence. "Praha nada," he intoned. "Prague is gone from the Web. The roads end in black sand." Here at GeoSync we stood in a cramped ledge under a mountain outcrop, small stones cascading past us. The black sky flicked raster fog; the nook lay bare and gray-pearled, its cracks and striations the metamorphic script of gnarled code.

Van Zandt spread foot-long fingers, drew them together; his warriors, now the gargoyles of Fenchurch Station, all tongues, teeth, and ears in blue-veined ivory, crowded onto the flat floor of the mountain recess. Long claws clacked to attention, gutturals rumbled and gurgled among them.

I scanned Pi: A fading parity hinted sentis, ghosting away under sky traffic as I searched. "And in the narrows of time?" We were inside a millisecond already.

"A heartbeat, one that fades, stops, starts. Scintillate, titillate, fibrillate, gone." He shrugged. One gargoyle coughed a word and held up a tatter of light. "And this." Van Zandt snatched the glitter in a long claw-pair and held it up. "It's alive. Don't touch it, Ali."

I came closer and studied the tiny shifting knot of radiance. Its surface crawled and coruscated with boiling shapes; some tried to spread brilliance onto Van Zandt's claw, but fell back into the shining turmoil.

"Back up, man! It's reaching!" Van Zandt whisked the light-knot away from me, a trail of sparks descending and vanishing where it had stretched toward my face. He passed the object back to the gar-

goyle, his buddy Wellbourn, who poked it into a warty growth on his chin, for storage.

This thing wanted me. My universe centered on me, and now my universe was trying to infect me with itself. "Why doesn't it hurt you or Wellbourn?"

Van Zandt grinned sharp teeth. "Oil of virus is our ointment and our salve. Biocrud is our shield and our salvation. Verily, even this shit can't touch us."

I pointed at his still-glowing nails. "What about that?"

He held up an infested finger. "No problem." He bit it off, spat it to the stone, and watched it shrivel into black dust. A new finger replaced it. One by one he took off his others, and sprouted new digits, grinning at me.

A gurgle from Wellbourn made us turn; his face had purpled, the wart flaring an epidemic of searing acid effulgence that decapitated him; the shockwave rattled our images. I smelled ions. The rest of Wellbourn blew past our faces in the cyber sunstream: dark sand.

We stared, aghast. "Correction: problem," said Van Zandt. "Ho, to it, beasts!" He sprang to the back of one of his remaining minions, and they hurled themselves from the ledge. "Meet us in Tesser Syem, Ali!"

The orange rime burned along the cracks of GeoSync W, spelling out my name in Arabic, twisting the letter-strokes to a curse, taunting me. I scried them for clues. Who was tracing me so quickly through the pulsing maze? And why? The orange tangles spread up the rock face over my head, forming a net, sagging toward me, clenching shut.

I vaulted backward off the mountain face into the void earthward, orange rays fanning past me, and I slid laterally toward a flock of gray birds arrowing downward to the Pacific, and I became one of them, to emerge in Kumaishi City at the warrior shrine. Now to find Arthurine. My lice gouged at my eyelids; I performed the shrine's passwording ablutions and drifted toward the entrance. Here was one of the great havens, designed by my numerical sensei Yoshio Takaishi, its encryptings assuring secrecy of entrance and meeting.

And the entrance became a mouth, fork-tongued and fanged, and I leaped away as a huge head burst forward, bulge-eyed and snapping. The shrine of Hachiman was gone. I faded to smoke and reassembled in the trans-Asia fibernest, shaking. The odds were that this shrine trap had taken Arthurine and her ronin unawares.

There was no sign of them.

I wanted to go home, to reassure myself, to know what still stood and whether the smoke from the dirt-world fires still blew over Spokane. But the destruction had come on so quickly that I had just time to solve its source and stop it. To go home would be to die: to see my body through my own cam as the roaches and flies gathered on it to feed.

The fibernest glistened with signal as the night sky with sheets of rain. Spangling here and there, a phosphorescence marked the beginnings of infection in the downpour. If I stayed, I would soon be standing among grasping tendrils of diseased light, all of them seeking me. I floated up through the rain, banked to the darkest stretches of the map, and dived through a gap free of the blight. Had Fazio really died? The bricks of Vienna might tell me.

Before I leaped, a soft voice spoke. "Ali, here." Jeanne, astride the crypto dragon, shot from far off to land by me in the growing darkness. "We found this." The dragon opened its jaws and spewed out a vast jumble of writhing text, in many shifting colors from deep red to brilliant blue-violet. "If you let it pass your eye, you can read it," she said. "Don't let your eye follow it, or it will confuse you."

I held my eyes on one spot relative to the background darkness, and read, "M: A HAS ESCAPED THE HOLOCITY FAMILY. TRY AGAIN AT HACHIMAN. F" M and F. I asked Jeanne, "Mai and Fazio?"

She shrugged. "You know best on this, Ali. Does it fit?"

"Not quite. Mai was at Holocity Quatre with me. Unless ..."

One drop of pale rain struck the dragon, sizzling, and ate its way inside. The dragon shrieked metal, spun four times, exploded in mica shards of scale. A jagged fragment sliced into my face where the lice feasted. Pain stabbed my eye; I clutched at the wound. When I looked up, Jeanne was gone.

Unless. Unless Mai was twinned, and I had seen what Fazio had

wanted for me. Unless Jeanne was Fazio's too. And who else?

For Jeanne the sorrow came, and I recalled our embraces in her Delhi flat, when she was Amra and I was Riley, lives ago, and we tunneled each other's bodies and souls with joy. That was before the Web consumed us.

Only Zvi was left to find. He caught me at Easter Island, in Vault Four.

"My three are dissolved, Freihof with them. The Web is failing." Zvi was a tragic mask, silvered with pale fog. "Ali, what can we do?"

"The others are gone, except Van Zandt. Go home." None of them could help me now. I had to face Fazio.

"To Al-Quds?" The holy city, Zvi's refuge and resting place, Jerusalem.

"Yes. Go home. This job is mine. You have done all you can."

"Is Arthurine gone?"

"Yes."

He shuddered, bowed, slid into the Euclidean thinness of a line, and sparked out.

I tried Tesser Syem, to see if Van Zandt had returned. It was a pipeline control node in lower Siberia, converted to support Geo-Sync Q and R satlinks; the cyber rooms stood vast and gloomy in timbered Gothic, nearly bare, the wood decaying from the rot that rode the Web. I waited, keeping my distance from the dissolution. Finally, a gargoyle, glowing eerily, limped from behind a pillar, his claws broken, his posture twisted.

"Van Zandt is gone," he growled, "and we are all done. I came to tell you. I was Saint-Germain, before you changed us." The gargoyle sat down. His body began spreading across the bare planking like a statue of melting butter. I edged away from his deliquescence, until

"That was before I knew you were alive."

"Of course I'm alive. I live in Spokane."

"No, you don't. You live here."

"You're lying. I was just in Spokane in the shitter this morning."

"Go and see. Look carefully, but don't power down your systems. I'll wait for you here."

I zagged to Spokane, surfaced quickly in my burrow, sank back into my body, took a deep breath, and struggled to my feet. Still the rat's nest of cables, the lounge, the Frutta tank. I felt myself, headed for the shitter. Everything was in working order. The smog still lingered, sour, over the city.

Why had Fazio said, "Don't power down?" I walked to the master breaker, fingered the switch. Did he think I'd gone virtual? The idiot. I flicked the switch off, then on immediately.

In less than a millisecond, the backup power kicked over, and a flash of darkness passed through me like a hole of pain. I walked back to stand facing the lounge. Orange iridescence gleamed on my cuticles, itched at the corners of my eyes. The shard ached, stabbed; I reached up to my eye and drew it out, and blinked. My sight shifted.

I stared hard at the lounge, no longer so afraid. Slowly a dark form took shape in the chair, its head tilted to the left, its sunken eyes closed under the harness glasses.

He was old, so old, maybe 75. The corners of the eye sockets lay tattered with decay. The left socket was empty. The body was long-limbed and dark-skinned, with sparse kinky white hair. His skin looked burned, shriveled, desiccated. A thin T-shirt and jeans tented over a gaunt belly void. A long time dead.

I looked around the cable-strewn room, its dust and decay now visible to me at last. No one had been here in weeks, months. I low-

SLOWLY A DARK FORM TOOK SHAPE IN THE CHAIR...

it all evaporated into the air. His voice echoed off in a singsong snarl, "Save the world, Ali!"

Was he mocking me? I found the hitchpoints for the Alaskan range, and strode to Dakota Vault AT892 to see Mai. She was waiting for me, slim and beautiful, just the way she had dressed when she sang Ben Xuan to me, and now she sang it again, reassuring me.

"My house was by a bridge on the water

You came to visit one day

Forest birds gathered by the shore of spring..."

I fell slowly into her melody, remembering our meeting in the dirt world, when I was Fourier, and we courted and loved, and promised everything we could not do.

"Hand in hand, we walked down the stream side

Looking at the birds, jealous and tender

Here our steps faltered..."

She took my hand, and her face became Fazio's.

Horror ran down my spine; I recoiled. I found my shuriken and flung one at him, and he did not avoid it. It caught him in the corner of the left eye, exactly in the spot where the lice itched and the shard was stuck in my own eye. "Leave me alone!" I shouted at him.

"You are alone," he said, his whole body appearing now to replace that of Mai. "You are hard to find." He wore a dark suit with no lapels, and a heavy pale shirt.

"Why do you chase me?"

"I'm not chasing you." He looked old, bent; his wavy hair was gray-ing.

"You're here."

"Not to chase you, but to speak with you."

"As you spoke with me before, in Vienna? When you tried to imprison me?"

ered my gaze, blinked away tears, started to shake. This dried forgotten husk was mine.

I accelerated away, my darkest fear come true. Was Fazio right? Had I somehow slipped into the Web, away from that rotting form, and found or invented every bodily sensation for myself? And had I run at top speed, as I was now doing, furiously creating the cyber world around me, to stay away and stay alive? It didn't make sense.

My flung shuriken lay bloody beside Fazio where he waited for me on the floor of the Dakota vault, aging hands clasping his knee, the shuriken's chaos eating into his image. Only his lips moved. "And?"

"What happened to me? What killed me?" I kept feeling my cyber-space body, more and more afraid that it would just vanish, like my friends' had done.

"I don't know. Malnutrition, aging, illness, maybe, coupled with the brain-rhythm hacks you were doing. You'd been living the Web for maybe 60 years. You went so deep, so fast—no way to reconstruct it all now." He looked sad. "Are you all right?"

"How can this be? Shouldn't I just fade away?" My knees shook. It felt just like being in the dirt world, but—"So I live here?"

"Yes, Arthur. This is your home. You are the first one we have found and spoken to. All the others ran and died. They nearly wrecked the entire Web, years ago. That was before I worked here." He looked past me into the darkness of a link the size of a traffic tunnel.

"They were your sentis?"

"No. The sentis were nothing, just reactives. The others were people. Terrified, raging, brilliant, psychotic people. Like you, but crazy. One of them nuked Birmingham, England, fifty 50 ago." He closed his eyes for a long moment.

"My name is Arthur?" I tasted the word, rolling it through my memories. Like looking through a vast heap of autumn leaves.

"It is the first of your names, the one your body died with. And you became Archie, and Arthurine, and Jeanne, and Van Zandt, and Zvi, and you were Riley and Fourier and Saint-Germain and thousands of others, and you took on lives as greedily as I eat Eastern food." Fazio chuckled, then his face turned serious. "You stole those names, when their owners met you in the cyber world, and gave the names to sentis of your own, and you created dramas for yourself and them, and acted them out."

"No! You're lying again!" I snatched another shuriken sheathed in my pocket. *You changed us*, Saint-Germain had said before he melted.

"I'm not lying. Summon your forces now—they'll tell you."

"They're dead, gone." But was Van Zandt actually rotting in a dumpster, and Zvi dead in his plasticked basement? And where were Arthurine and Jeanne, and what were all their names? My head spun.

"Try." His voice was soft, urgent.

I sent forth my winged message in feathered lightning. "This is useless. I saw them vanish. Their bodies will look just like mine." We locked eyes, waiting; his look was so patient, so steady, that I turned away. No one came. "See?"

"Access their homes. I'll be here."

So I committed the one great violation, and linked directly into Van Zandt's dumpster. The place was misted with dark fog; I could see nothing. Something large and uncertain groped toward me. "Who's there?" The voice was deep, scratchy, old.

"It's... Arthur. I wanted to see if you were all right."

A rasping laugh. "I'm better off than you. Get out of here."

"Are you Van Zandt?"

"I was."

"Where is Mai?" My insides churning, I readied the razor-sharp shuriken. This chill rage felt familiar; its familiarity shocked me.

"Quinh Mai is alive. She loves you."

"How could she?" Bitterness rose in me. "She betrayed me to you."

"She's known all along who and what you are."

"Bring her to me, then."

"You will have to find her on your own. She is not mine to command."

I hesitated. The truth flooded over me: *Not mine to command*. All I had lived was an act of will, an act of command that kept me speeding away from the new truth of my existence. My body was gone, but I lived here, now, for as long as the waves that constituted me would resonate. It staggered me. The weapon in my fingers dropped to the vault floor with a small clank.

Fazio spoke gently. "You see, no one has ever communicated as we are now doing. You have vast power, and you nearly destroyed the financial fabric of the entire world, in order to grant yourself the sustaining fantasy of rescuing it. Will power is a tricky entity. Conscience is slower, and much harder. Your conscience is finally awake, or you would have killed me by now."

The failing Web was my own work. Stunned, I sank onto my knees beside him. For the first time I could remember, I felt warmth inside me. It drew me to Fazio, even as I knew he could destroy me or damage me, and I him. It was love. "You'd let me go?"

"Of course. How could I stop you anyway? Conscience is rare and precious. You are infinitely rare and infinitely precious. I knew that in Vienna, when we first met, in the shadowy hall of a mountain king. You were playing an entire horn section, and your imagos all stood and nodded their horns when I came in." He smiled at me. "I haven't got the wisdom and speed to be your friend, but I believe in you. To get here, I had to give up everything I had, and risk death."

A LARK LOOPED AND SCRIBED A RED HORIZON MOON

"Was?"

"So you have no memory, or else you can lie. Either way, a bad start for a senti."

Was that it? I was just an AI? "I'm no senti."

"You stole Van Zandt from me and used the persona. I did time when the Feds pinned me for the millions in gold you shifted. They should have pinned you. Now get out." The dark form stretched, engulfed me, spat me out into a dim transit. The rasp of words followed, "Fazio freed me. He said to send you to him when you came back. So go back to Fazio." The dumpster rocked, swiveled, vanished.

At least he wasn't dead. I raced to Arthurine's in Atlanta, via the four-hundredth-floor mast that stuck out westward over the city.

Her name was not Arthurine, but Violet. She said, "Go to Fazio," and sent me away.

Jeanne and Zvi heard my name, and barred the way without a word more.

But they lived. I hadn't killed them.

It had all been so clear: the lovemaking, the adventures, the words of trust. Now I reached for the memories, and found only fading wisps and tatters of light, just like the sickness of the Web. Fazio had stolen my life. A cold resolve filled me; I returned and said to him, "I'll kill you for this."

"You can kill me if you want. But what I've said, what you've seen, is true. I tried very hard to get you to see that, a long time ago." Fazio turned his head. "Go ahead. Put your sharp edge through my neck here, where the neural blood flows. It will stop the heart in my body back where it lies now. Then you can keep running and creating armies to destroy and seize and save the world. For yourself." He sat and waited.

"So you finally caught me." I relaxed a little.

"Deep inside, far back in the storm of yourself, you knew the truth, and you headed straight for me. Do you think others can't understand denial? I'm an expert. Why do you think I wouldn't give up on you?" He put a hand over mine. "Why did you come seeking me when Mai warned you?"

"Do you really think Mai still wants to see me?" I wondered; so many things had slipped away, and I had thrown away so many more.

"Arthur, once again, she's not your invention, and she's not my puppet. You'll have to ask her yourself. You're breaking new ground: a living man with a body made of light. Who knows what will happen?"

"She's not your puppet? But you used her to trap me. She helped you do it."

Fazio didn't pause. "Absolutely. We both wanted to get your attention. It worked because you chose."

"But will I keep on living? I'm just a metaphor, now." The bitterness came back.

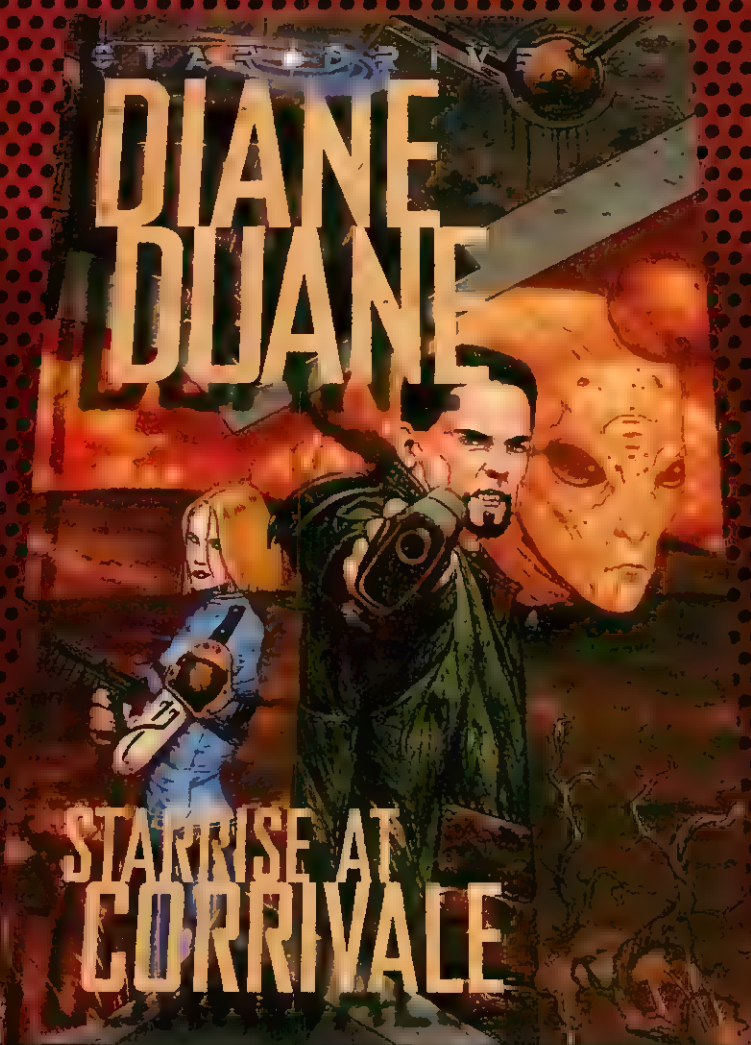
"I don't know, any more than I know I will keep on living. But I think so. And you're no metaphor. No one really loves a metaphor, and a metaphor doesn't love."

"But I'm *here*. In this vault. And I can see and taste and touch and smell and hear. How can that be if I'm... without a body?"

Fazio said, "We're still learning about that. You're not just here. Your awareness is here, but your neurosystem is woven all around the world. You have sense-analogs and integrative analogs and memory-analogs, but without simple physical localization. It's as if you have a few optical receptors at one site, a few at the next, all woven through and around the entire planet. Your nose breathes

Continued on page 96

OUT HERE, THERE'S NOTHING TO
LOSE BUT YOUR LIFE



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The crew of the *Adventurer* was the first to make the great leap to the stars.

A DANCE TO

What lay within the Alpha Centauri system could very well cause them to be the last.

The first crewed starship, the *Adventurer*, hung like a gleaming metallic moon among the gyre of strange worlds. Alpha Centauri was a triple-star system. A tiny flare star dogged the two big suns. At this moment in its eternal dance, the brilliant mote swung slightly toward Sol. Even though it was far from the two bright stars it was the nearest star to Earth: Proxima.

The two rich, yellow stars defined the Centauri system. Still prosaically termed A and B, they swam about each other, ignoring far Proxima.

The *Adventurer's* astronomer, John, dopplered in on both stars, refreshing memories that were lodged deep. The climax of his career loomed before him. He felt apprehension, excitement, and a thin note of something like fear.

Sun B had an orbital eccentricity of 0.52 about its near-twin, with the extended axis of its ellipse 23.2 astronomical units long. This meant that the closest approach between A and B was a bit farther than the distance of Saturn from Sol.

A was a hard yellow-white glare, a G star with 1.08 the Sun's mass. Its companion, B, was a K-class star that glowed a reddish yellow, since it had 0.88 times the Sun's mass. B orbited with a period of 80 years around A. These two were about 4.8 billion years of age, slightly older than Sol. Promising.

Sun A's planetary children had stirred *Adventurer's* expedition forth from Earth. From Luna, the system's single Earth-class planet was a mere mote, first detected by an oxygen absorption line in its spectrum. Only a wobbly image could be resolved by Earth's kilometer-sized interferometric telescope, a long bar with mirror-eyes peering in the spaces between A and B. Just enough of an image to entice.

A new Earth? John peered at its shrouded majesty, feeling the slight hum and surge of their ship beneath him. They were steadily moving inward, exploring the Newtonian gavotte of worlds in this two-sunned ballroom of the skies. Proxima was so far away, it was not even a wallflower.

The Captain had named the fresh planet Shiva. It hung close to A, wreathed in water cirrus, a cloudball dazzling beneath A's simmering yellow-white glare. Shimmering with promise, it had beckoned to John for years during their approach.

Like Venus, but the gases don't match, he thought. The complex tides of the star system massaged Shiva's depths, releasing gases and rippling the crust. John's many-frequency probeings

STRANGE



ILLUSTRATION BY DOUG ANDERSON

MUSICS

BY
GREGORY
BENFORD

had told him a lot, but how to stitch data into a weave of a world? He was the first astronomer to try out centuries of speculative thinking on a real planet.

Shiva was drier than Earth, oceans taking only 40 percent of the surface. Its air was heavy in nitrogen, with giveaway tags of 18 percent oxygen and traces of carbon dioxide; remarkably Earth-like. Shiva was too warm for comfort, in human terms, but not fatally so; no Venusian runaway greenhouse had developed here. How had Shiva escaped that fate?

Long before, the lunar telescopes had made one great fact clear: The atmosphere here was far, far out of chemical equilibrium. Biological theory held that this was inevitably the signature of life. And indeed, the expedition's first mapping had shown that green, abundant life clung to two well-separated habitable belts, each beginning about 30 degrees from the equator.

Apparently the weird tidal effects of the Centauri system had stolen Shiva's initial polar tilt. Such steady workings had now made its spin align to within a single degree with its orbital angular momentum, so that conditions were steady and calm. The equatorial belt was a pale, arid waste of perpetual tornadoes and blistering gales.

John close-upped in all available bands, peering at the planet's crescent. Large blue-green seas, but no great oceans. Particularly, no water links between the two milder zones, so no marine life could migrate between them. Land migrations, calculations showed, were effectively blocked by the great equatorial desert. Birds might make the long flight, John considered, but what evolutionary factor would condition them for such hardship? And what would be the reward? Why fight the jagged mountain chains? Better to lounge about in the many placid lakes.

A strange world, well worth the decades of grinding, slow, starship flight, John thought. He asked for the full display and the observing bowl opened like a flower around him. He swam above the entire disk of the Centauri system now, the images sharp and rich.

To be here at last! *Adventurer* was only a mote among many—yet here, in the lap of strangeness. Far Centauri.

It did not occur to him that humanity had anything truly vital to lose here. The doctrine of expansion and greater knowledge had begun seven centuries before, making European cultures the inheritors of Earth. Although science had found unsettling truths, even those revelations had not blunted the agenda of ever-greater knowledge. After all, what harm could come from merely looking?

The truth about Shiva's elevated ocean only slowly emerged. Its very existence was plainly impossible, and therefore was not at first believed.

Odis was the first to notice the clues. Long days of sensory immersion in the data-streams repaid her. She was rather proud of having plucked such exotica from the bath of measurements their expedition got from their probes—the tiny speeding, smart spindle-eyes that now cruised all over the double-stars' realm.

The Centauri system was odd, but even its strong tides could not explain this anomaly. Planets should be spherical, or nearly so; Earth bulged but a fraction of a percent at its equator, due to its spin. Not Shiva, though.

Odis found aberrations in this world's shape. The anomalies were far away from the equator, principally at the 1,694-kilometer-wide deep blue sea, immediately dubbed the Circular Ocean. It sat in the southern hemisphere, its nearly perfect ring hinting at an origin as a vast crater. Odis could not take her gaze from it, a blue eye peeking coyly at them through the clouds: a planet looking back.

Odis made her ranging measurements, gathering in her data like number-clouds, inhaling their cottony wealth. Beneath her, *Adventurer* prepared to go into orbit about Shiva.

She breathed in the banks of data-vapor, translated by her kinesthetic programming into intricate scent-inventories. Tangy, complex.

At first she did not believe the radar reflections. Contours leaped into view, artfully sketched by the mapping radars. Calibrations checked, though, so she tried other methods: slow, analytical, tedious, hard to do in her excitement. They gave the same result.

The Circular Ocean stood a full 10 kilometers higher than the continent upon which it rested.

No mountains surrounded it. It sat like some cosmic magic trick, insolently demanding an explanation.

Odis presented her discovery at the daily Oversight Group meeting. There was outright skepticism, even curled lips of derision, snorts of disbelief. "The range of methods is considerable," she said adamantly. "These results cannot be wrong."

"Only thing to resolve this," a lanky geologist said, "is get an edge-on view."

"I hoped someone would say that," Odis smiled. "Do I have the authorized observing time?"

They gave it reluctantly. *Adventurer* was orbiting in a severe ellipse about Shiva's cloud-wrack. Her long swing brought her into a side view of the target area two days later. Odis used the full panoply of optical, IR, UV, and microwave instruments to peer at the Circular Ocean's perimeter, probing for the basin that supported the round slab of azure water.

There was none. No land supported the hanging sea.

This result was utterly clear. The Circular Ocean was 1.36 kilometers thick and a brilliant blue. Spectral evidence suggested water rich in salt, veined by thick currents. It looked exactly like an enormous, troubled mountain lake, with the mountain subtracted.

Beneath that layer there was nothing but the thick atmosphere. No rocky mountain range to support the ocean-in-air. Just a many-kilometer gap.

All other observations halted. The incontrovertible pictures showed an immense layer of unimaginable weight, blissfully poised above mere thin gases, contradicting all known mechanics. Until this moment Odis had been a lesser figure in the expedition. Now her work captivated everyone and she was the center of every conversation. The concrete impossibility yawned like an inviting abyss.

Lissa found the answer to Shiva's mystery, but no one was happy with it.

An atmospheric chemist, Lissa's job was mostly done well before they achieved orbit around Shiva. She had already probed and labeled the gases, shown clearly that they implied a thriving biology below. After that, she had thought, the excitement would shift elsewhere, to the surface observers.

Not so. Lissa took a deep breath and began speaking to the Oversight Group. She had to show that she was not wasting their time. With all eyes on the Circular Ocean, few cared for mere air.

Yet it was the key, Lissa told them. The Circular Ocean had intrigued her, too: so she looked at the mixture of oxygen, nitrogen, and carbon dioxide that apparently supported the floating sea. These proved perfectly ordinary, almost Earth-standard, except for one oddity. Their spectral lines were slightly split, so that she found two small spikes to the right and left of where each line should be.

Lissa turned from the images she projected before the Oversight Group. "The only possible interpretation," she said crisply, "is that an immensely strong electric field is inducing the tiny electric dipoles of these molecules to move. That splits the lines."

"An electric shift?" a grizzled skeptic called. "In a charge-neutral atmosphere? Sure, maybe when lightning flashes you could get a momentary effect, but —"

"It is steady."

He was the first astronomer to try out centuries of speculative thinking on a real planet.

"You looked for lightning?" a shrewd woman demanded.

"It's there, sure. We see it forking between the clouds below the Circular Ocean. But that's not what causes the electric fields."

"What does?" This from the grave captain, who never spoke in scientific disputes. All heads turned to him, then to Lissa.

She shrugged. "Nothing reasonable." It pained her to admit it, but ignorance was getting to be a common currency.

A voice called, "So there must be an impossibly strong electric field *everywhere* in that 10 kilometers of air below the ocean?" Murmurs of agreement. Worried frowns.

"Everywhere, yes." The bald truth of it stirred the audience. "Everywhere."

Tagore was in a hurry. Too much so.

He caromed off a stanchion but did not let that stop him from rebounding from the opposite wall, absorbing his momentum with his knees, and springing off with a full push. Rasters streaked his augmented vision, then flickered and faded.

He coasted by a full-view showing Shiva and the world below, a blazing crescent transcendent in its cloud-wrapped beauty. Tagore ignored the spectacle; marvels of the mind preoccupied him.

He was carrying the answer to it all, he was sure of that. In his haste he did not even glance at how blue-tinged sunlight glinted from the Circular Ocean. The thick disk of open air below it made a clear line under the blue wedge. At this angle the floating water refracted sunlight around the still-darkened limb of the planet. The glittering azure jewel heralded dawn, serene in its impudent impossibility.

The youngest of the entire expedition, Tagore was a mere theorist. He had specialized in planetary formation at university, but managed to snag a berth on this expedition by developing a ready, quick facility at explaining vexing problems the observers turned up. That, and a willingness to do scutwork.

"Cap'n, I've got it," he blurted as he came through the hatch. The captain greeted him, sitting at a small oak desk, the only wood on the whole ship—then got to business. Tagore had asked for this audience because he knew the effect his theory could have on the others; so the captain should see first.

"The Circular Ocean is held up by electric field pressure," he announced. The captain's reaction was less than he had hoped: unblinking calm, waiting for more information.

"See, electromagnetic fields exert forces on the electrons in atoms," Tagore persisted, going through the numbers, talking fast. "The fields down there are so strong—I got that measurement out of Lissa's data—they can act like a steady support."

He went on to make comparisons: the energy density of a hand grenade, contained in every suitcase-sized volume of air. Even though the fields could simply stand there, as trapped waves, they had to suffer some losses. The power demands were *huge*. Plus, how the hell did such a gargantuan construction *work*?

By now Tagore was thoroughly pumped, oblivious to his audience. Finally the captain blinked and said, "Anything like this ever seen on Earth?"

"Nossir, not that I've ever heard."

"No natural process can do the stunt?"

"Nossir, not that I can imagine."

"Well, we came looking for something different."

Tagore did not know whether to laugh or not; the captain was unreadable. Was this what exploration was like—the slow anxiety of not knowing? On Earth such work had an abstract distance, but here...

He would rather have some other role. Bringing uncomfortable truths to those in power put him more in the spotlight than he wished.

Captain Badquor let the Tagore kid go on a bit longer before he said anything more. It was best to let these technical types sing their songs first. So few of them ever thought about anything beyond their own warblings.

He gave Tagore a captainly smile. Why did they all look so young? "So this whole big thing on Shiva is artificial."

"Well, yeah, I suppose so..."

Plainly Tagore hadn't actually thought about that part very much; the wonder of such strong fields had stunned him. Well, it was stunning. "And all that energy, just used to hold up a lake?"

"I'm sure of it, sir. The numbers work out, see? I equated the pressure exerted by those electric fields, assuming they're trapped in the volume under the Circular Ocean, the way waves can get caught if they're inside a conducting box —"

"You think that ocean's a conductor?" Might as well show the kid that even the captain knew a little physics. In fact, though he never mentioned it, he had a doctorate from MIT. Not that he had learned much about command there.

"Uh, well, no. I mean, it is a fairly good conductor, but for my model, it's only a way of speaking —"

"It has salt currents, true? They could carry electrical currents." The captain rubbed his chin, the machinery of his mind trying to grasp how such a thing could be. "Still, that doesn't explain why the thing doesn't evaporate away, at those altitudes."

"Uh, I really hadn't thought..."

The captain waved a hand. "Go on." *Sing for me.*

"Then the waves exert an upward force on the water every time they reflect from the underside of the ocean —"

"And transfer that weight down, on invisible waves, to the rock that's 10 kilometers below."

"Uh, yessir."

Tagore looked a bit constipated, bursting with enthusiasm, with the experience of the puzzle, but not knowing how to express it. The captain decided to have mercy on the kid. "Sounds good. Not anything impossible about it."

"Except the *size* of it, sir."

"That's one way to put it."

"Sir?"

A curious, powerful feeling washed over the captain. Long decades of anticipation had steeled him, made him steady in the presence of the crew. But now he felt his sense of the room tilt, as though he were losing control of his status-space. The mind could go whirling off, out here in the inky immensities between twin alien suns. He frowned. "This thing is bigger than anything humanity ever built. And there's not a clue what it's for. The majesty of it, son, that's what strikes me. Grandeur."

John slipped into his helmet and Shiva enclosed him. *To be wrapped in a world*—His pov shifted, strummed, arced with busy fretworks—then snapped into solidity, stabilized.

Astronomy had become intensely interactive in the past century, the spectral sensoria blanketing the viewer. Through *Adventurer's* long voyage he had tuned the system to his every whim. Now it gave him a nuanced experience like a true, full-bodied immersion.

He was eager to immerse himself in the *feel* of Shiva, in full 3-D wraparound. Its crescent swelled below like a ripe, mottled fruit. He plunged toward it. A planet, fat in bandwidth.

For effect—decades before he had been a sky-diver—John had arranged the data-fields so that he accelerated into it. From their arcing orbit he shot directly toward Shiva's disk. Each mapping rushed toward him, exploding upward in finer detail. *There—*

The effect showed up first in the grasslands of the southern habitable belt. He slewed toward the plains, where patterns emerged in quilted confusions. After Tagore's astonishing theory about the Circular Ocean—odd, so audacious, and coming from a nonscientist—John had to be ready for anything. Somewhere in the data-fields must lurk the clue to who or what had made the ocean.

Below, the great grassy shelves swelled. But in places the grass was thin. Soon he saw why. The natural grass was only peeking out across plains covered with curious orderly patterns—hexagonals folding into triangles where necessary to cover hills and valleys, right up to the muddy banks of the slow-moving brown rivers.

Reflection in the UV showed that the tiles making this pattern were often small, but with some the size of houses, meters thick...and moving. They all jostled and worked with restless energy, to no obvious purpose.

Alive? The UV spectrum broke down into a description of a complex polymer. Cross-linked chains bonded at many oblique angles to each other, flexing like sleek micro-muscles.

John brought in chemists, biologists in an ensemble suite: Odis and Lissa chimed in the scientific choir. In the wraparound display he felt them by the shadings they gave the data.

The tiles, Lissa found, fed on their own sky. Simple sugars rained from the clotted air, the fruit of an atmosphere that resembled an airy chicken soup. *Atmospheric electro-chemistry seems responsible, somehow*, Lissa sent. Floating microbial nuggets moderated the process.

The tiles were prime eaters. Oxidizing radicals the size of golf balls patrolled their sharp linear perimeters. These pack-like rollers attacked invader chemicals, ejecting most, harvesting those they could use.

Lissa brought in two more biologists, who of course had many questions. *Are these tiles like great turtles?* one ventured, then chuckled uneasily. They yearned to flip one over.

Diurnal or nocturnal? *Some are, most aren't.*

Are there any small ones? *A few.*

Do they divide by fission? *No, but....* Nobody understood the complicated process the biologists witnessed. Reproduction seems a tricky matter.

There is some periodicity to their movements, some slow rhythms, and particularly a fast Fourier-spectrum spike at 1.27 seconds—but again, no clear reason for it.

Could they be all one life form?—could that be?

A whole planet taken over by a tiling-thing that co-opts all resources?

The senior biologists scoffed. How could a species evolve to have only one member? And an ecosystem—a whole world!—with so few parts?

Evolution ruled that out. Bio-evolution, that is. But not social evolution.

John plunged further into the intricate matrices of analysis. The endless tile-seas cloaking mountains and valleys shifted and milled, fidgety, only occasionally leaving bare ground visible as a square fissioned into triangles. Oblongs met and butted with fevered energy.

Each hemisphere of the world was similar, though the tiles in the north had different shapes—pentagonals, mostly. Nowhere did the tiles cross rivers but they could ford streams. A Centauri variant of chlorophyll was everywhere, in the oceans and rivers, but not in the Circular Ocean.

The ground was covered with a thin grass, the sprigs living off the momentary sunlight that slipped between the edges in the jostling, jiggling, bumping, and shaking. Tiles that moved over the grass sometimes cropped it, sometimes not, leaving stubs that seemed to have been burned off.

The tiles' fevered dance ran incessantly, without sleep. Could these things be performing some agitated discourse, a lust-fest without end?

John slowed his descent. The tiles were a shock. Could these be the builders of the Circular Ocean? Time for the biologists to get to work.

The computer

folk thought one way, the biologists—after an initial rout, when they rejected the very possibility of a single entity filling an entire biosphere—quite another.

After some friction, their views converged somewhat. A biologist remarked that the larger tiles came together like dwarf houses making love...gingerly, always presenting the same angles and edges.

Adventurer had scattered micro-landers all over the world. These showed only weak electromagnetic fringing fields among the tiles. Their deft collisions seemed almost like neurons in a two-dimen-

sional plan.

The analogy stirred the theorists. Over the usual after-shift menu of beer, soy nuts, and friendly insults, one maven of the digital realm ventured an absurd idea: Could the planet have become a computer?

Everybody laughed. They kidded the advocate of this notion...and then lapsed into frowning silence. Specialists find quite unsettling those ideas that cross disciplines.

Could a species turn itself into a biological computer? The tiles did rub and caress each other in systematic ways. Rather than carrying information in digital fashion, maybe they used a more complex language of position and angle, exploiting their planar geometry. If so, the information density flowing among them was immense. Every collision carried a sort of Euclidean talk, possibly rich in nuance.

The computer analogy brought up a next question—not that some big ones weren't left behind, perhaps lying in wait to bite them on their conceptual tail. Could the tiles know anything more than themselves? Or were they strange, geometroid solipsists? Should they call the tiles a single It?

Sealed inside a cosmos of Its own making, was It even in principle interested in the outside world? Alpha Centauri fed It gratuitous energy, the very soupy air fueled It: the last standing power on the globe. What reason did it have to converse with the great Outside?

Curiosity, perhaps? The biologists frowned at the prospect. Curiosity in early prehumans was rewarded in the environment. The evolving ape learned new tricks, found fresh water, killed a new kind of game, invented a better way to locate those delicious roots—and the world duly paid it back.

Apparently—but don't ask us why just yet! the biologists cried—the game was different here. What reward came from the tiles' endless smacking together?

So even if the visiting humans rang the conceptual doorbell on the tile-things, maybe nobody would answer. Maybe nobody was home. Should they try?

John and Odis and Lissa, Tagore and the captain, over a hundred other crew—they all pondered.

2

While they wrestled with the issue, exploration continued.

A flitter craft flew near the elevated ocean and inspected its supporting volume with distant sensors and probing telescopes. Even Shiva's weather patterns seemed wary of the Circular Ocean. Thunderclouds veered away from the gap between the ocean and the rugged land below. In the yawning height clouds formed but quickly dispersed, as if dissolved by unseen forces.

Birds flew through the space, birds like feathery kites.

Somehow they had missed noticing this class of life. Even the micro-landers had not had the speed to capture their darting lives. And while the kite-birds did seem to live mostly on tiny floating balloon-creatures that hovered in the murky air of the valleys, they were unusually common beneath the Circular Ocean.

John proposed that he send in a robo-craft of bird size, to measure physical parameters in the heart of the gap. Captain Badquor approved. The shops fabricated a convincing fake. Jet-powered and featuring fake feathers, it was reasonably convincing.

John flew escort in a rocket-plane. The bird-probe got 17 kilometers inside and then disappeared in a dazzling blue-white electrical discharge. Telemetry showed why: The Circular Ocean's support was a complex weave of electrical fields, supplying an upward pressure. These fields never exceeded the breakdown level of a megavolt per meter, above which Shiva's atmosphere would ionize. Field strength was about a million volts per meter.

The robo-craft had hit a critical peak in the field geometry. A conductor, it caused a flashover that dumped millions of watts into the bird within a millisecond.

As the cinder fell, John banked away from his monitoring position five kilometers beyond the gap perimeter. There was no particular

reason to believe a discharge that deep within the gap would somehow spread, engulfing the region in a spontaneous discharge of the enormous stored energies. Surely whoever—no, whatever—had designed the Circular Ocean's supports would not allow the electromagnetic struts to collapse from the frying of a mere bird.

But something like that happened. The system responded.

The burned brown husk of the pseudo-bird turned lazily as it fell and sparks jumped from it. These formed a thin orange discharge that fed on the energy coursing through the now-atomized bird. The discharging line snaked away, following unerringly the bird's prior path. It raced at close to the speed of light back along the arc.

The system had *memory*, John realized. He saw a tendril of light at the corner of his vision as he turned his flitter craft. He had time only to think that it was like a huge, fast finger jabbing at him. An apt analogy, though he had no time to consider ironies. The orange discharge touched the flitter. John's hair stood on end as charge flooded into the interior.

Ideally, electrons move to the outer skin of a conductor. But when antennae connect deep into the interior, circuits can close.

Something had intended to dump an immense charge on the flitter, the origin of the pseudo-bird. Onboard instruments momentarily reported a charge exceeding 17 coulombs. By then John had, for all intents and purposes, ceased to exist as an organized bundle of electrical information.

John's death did yield a harvest of data. Soon enough Lissa saw the true function of the Circular Ocean. It was but an ornament, perhaps an artwork.

Ozone fizzed all around it. Completely natural-seeming, the lake crowned a huge cavity that functioned like a steady, standing laser.

The electrical fields both supported the Ocean and primed the atoms of the entire atmosphere they permeated. Upon stimulus—from the same system that had fried John—the entire gap could release the stored energy into an outgoing electromagnetic wave. It was an optical bolt, powerful and complex in structure—triggered by John.

Twice more the ocean's gap discharged naturally as the humans orbited Shiva. The flash lasted but a second, not enough to rob the entire ocean structure of its stability. The emission sizzled out through the atmosphere and off into space.

Laser beams are tight, and this one gave away few of its secrets. The humans, viewing it from a wide angle, caught little of the complex structure and understood less.

Puzzled, mourning John, they returned to a careful study of the Shiva surface. Morale was low. The captain felt that a dramatic gesture could lift their spirits. He would have to do it himself.

To Captain Badquor fell the honor of the first landing. A show of bravery would overcome the crew's confusions, surely. He would direct the complex exploring machines in real-time, up close.

He left the landing craft fully suited up, impervious to the complex biochem mix of the atmosphere.

The tiles jostled downhill from him. Only in the steep flanks of this equatorial mountain range did the tiles not endlessly surge. Badquor's boots crunched on a dry, crusty soil. He took samples, sent them back by runner-robo.

A warning signal from orbit: The tiles in his area seemed more agitated than usual. A reaction to his landing?

The tile polygons were leathery, with no obvious way to sense him. No eyes or ears. They seemed to caress the ground lovingly, though Badquor knew that they tread upon big crabbed feet.

He went forward cautiously. Below, the valley seemed alive with

rippling turf, long waves sweeping to the horizon in the twinkling of an instant. He got an impression of incessant pace, of enthusiasm unspoken but plainly endless.

His boots were well insulated thermally, but not electrically; thus, when his headphones cracked he thought he was receiving noise in his transmission lines. The dry sizzle began to make his skin tingle.

Only when the frying noise rose and buried all other signals did he blink, alarmed. By then it was too late.

Piezoelectric energy arises when mechanical stress massages rock. Pressure on an electrically neutral stone polarizes it at the lattice level by slightly separating the center of positive charge from the negative. The lattice moves, the shielding electron cloud does not. This happens whenever the rock crystal structure does not have a center of structural symmetry, and so occurs in nearly all bedrock.

The effect was well known on Earth, though weak. Stressed strata sometimes discharged, sending glow discharges into the air. Such plays of light were now a standard precursor warning of earthquakes. But Earth was a mild case.

Tides stressed the stony mantle of Shiva, driven by the eternal gravitational gavotte of both stars, A and B. Periodic alignments of the two stars stored enormous energy in the full body of the planet. Evolution favored life that could harness these electrical currents that rippled through the planetary crust. This, far more than the kilowatt per square meter of sunlight, drove the tile-forms.

All this explanation came after the fact, and seemed obvious in retrospect. The piezoelectric energy source was naturally dispersed and easily harvested. A sizzle of electric micro-fields fed the tiles' large, crusted footpads. After all, on Earth fish and eels routinely use electrical fields as both sensors and weapons.

This highly organized ecology sensed Badquor's intrusion immediately. To them, he probably had many of the signatures of a power-parasite. These were small creatures like stick insects that Badquor himself had noticed after landing; they lived by stealing electrical charge from the tile polygons.

Only later analysis made it clear what had happened. The interlinked commonality of piezo-driven life moved to expel the intruder by overpowering it—literally.

Badquor probably had no inkling of how strange a fate he had met, for the several hundreds of amperes caused his muscles to seize up, his heart to freeze in a clamped frenzy, and his synapses to discharge in a last vision that burned into his eyes a vision of an incandescent rainbow.

Lissa blinked. The spindly trees looked artificial, but weren't.

Groves of them spiraled around hills, zigzagged up razor-backed ridges and shot down the flanks of denuded rock piles. Hostile terrain for any sort of tree that earthly biologists understood. The trees, she noted, had growing patterns that bore no discernible relation to water flow, sunlight exposure, or wind patterns.

That was why Lissa went in to see. Her team of four had already sent the smart-eyes, rugged robots, and quasi-intelligent processors. Lightweight, patient, durable, these ambassadors had discovered little. Time for something a bit more interactive on the ground.

That is, a person. Captain Badquor's sacrifice had to mean something, and his death had strengthened his crew's resolve.

Lissa landed with electrically insulated boots. They now understood the piezoelectric ecology in broad outline, or thought they did. Courageous caution prevailed.

The odd beanpole trees made no sense. Their gnarled branches

**"This thing is bigger than anything humanity ever built.
And there's not a clue what it's for."**

followed a fractal pattern and had no leaves. Still, there was ample fossil evidence—gathered by automatic prospectors sent down earlier—that the bristly trees had evolved from more traditional trees within the past few million years. But they had come so quickly into the geological record that Lissa suspected they were “driven” evolution—biological technology.

She carefully pressed her instruments against the sleek black sides of the trees. Their surfaces seethed with electric currents, but none strong enough to be a danger.

On Earth, the natural potential difference between the surface and the upper atmosphere provides a voltage drop of a hundred volts for each meter in height. A woman two meters tall could be at a significantly higher potential than her feet, especially if her feet had picked up extra electrons by walking across a thick carpet.

On Shiva this effect was much larger. The trees, Lissa realized, were harvesting the large potentials available between Shiva's rocky surface and the charged layers skating across the upper reaches of the atmosphere.

The “trees” were part of yet another way to reap the planetary energies—whose origin was ultimately the blunt forces of gravity, mass and torque—all for the use of life.

The potential-trees felt Lissa's presence quickly enough. They had evolved defenses against poachers who would garner stray voltages and currents from the unwary.

In concert—for the true living entity was the grove, comprising perhaps a million trees—they reacted.

Staggering back to her lander, pursued by vagrant electrical surges through both ground and the thick air, she shouted into her suit mike her conclusions. These proved useful in later analysis.

She survived, barely.

3. When the sum of these incidents sank in, the full import became clear. The entire Shiva ecology was electrically driven. From the planet's rotation and strong magnetosphere, from the tidal stretching of the Centauri system, from geological rumblings and compressions, came far more energy than mere sunlight could ever provide.

Seen this way, all biology was an afterthought. The geologists, who had been feeling rather neglected lately, liked this turn of events quite a bit. They gave lectures on Shiva seismology which, for once, everybody attended.

To be sure, vestigial chemical processes still ran alongside the vastly larger stores of charges and potentials; these were important for understanding the ancient biosphere that had once governed here.

Much could be learned from classic, old-style biology: from samples of the bushes and wiry trees and leafy plants, from the small insect-like creatures of 10 legs each, from the kite-birds, from the spiny, knife-like fish that prowled the lakes.

All these forms were ancient, unchanging. Something had fixed them in evolutionary amber. Their forms had not changed for many hundreds of millions of years.

There had once been higher forms, the fossil record showed. Something like mammals, even large tubular things that might have resembled reptiles.

But millions of years ago they had abruptly ceased. Not due to some trauma, either—they all ended together, but without the slightest sign of a shift in the biosphere, of disease or accident.

The suspicion arose that something had simply erased them, having no further need.

The highest form of life—defined as that with the highest brain/body volume ratio—had vanished slightly later than the oth-

ers. It had begun as a predator wider than it was tall, and shaped like a turtle, though without a shell.

It had the leathery look of the tile-polygons, though.

Apparently it had not followed the classic mode of pursuit, but rather had outwitted its prey, boxing it in by pack-animal tactics. Later, it had arranged deadfalls and traps. Or so the sociobiologists suspected, from narrow evidence.

These later creatures had characteristic bony structures around the large, calculating brain. Subsequent forms were plainly intelligent, and had been engaged in a strange manipulation of their surroundings. Apparently without ever inventing cities or agriculture, they had domesticated many other species.

Then, the other high life forms vanished from the fossil record. The scheme of the biosphere shifted. Electrical plant forms, like the spindly trees and those species that fed upon piezoelectric energy, came to the fore.

Next, the dominant, turtle-like predators vanished as well. Had they been dispatched?

On Shiva, all the forms humans thought of as life, plant and animal alike, were now in fact mere...well, maintenance workers. They served docilely in a far more complex ecology. They were as vital and as unnoticeable and as ignorable as the mitochondria in the stomach linings of *Adventurer's* crew.

Of the immensely more complex electrical ecology, they were only beginning to learn even the rudiments. If Shiva was in a sense a single interdependent, colonial organism, what were its deep rules?

By focusing on the traditional elements of the organic biosphere they had quite missed the point.

Then the Circular Ocean's laser discharged again. The starship was nearer the lancing packet of emission, and picked up a side lobe. They learned more in a millisecond than they had in a month.

A human brain has about 10 billion neurons, each connected with about 100,000 of its neighbors. A firing neuron carries one bit of information. But the signal depends upon the path it follows, and in the labyrinth of the brain there are 1,015 pathways. This torrent of information flows through the brain in machine-gun packets of electrical impulses, coursing through myriad synapses. Since a single book has about a million bits in it, a single human carries the equivalent of a billion books of information—all riding around in a two-kilogram lump of electrically wired jelly.

Only one to 10 percent of a human brain's connections are firing at any one time. A neuron can charge and discharge at best a hundred times in a second. Human brains, then, can carry roughly 1,010 bits of information in a second.

Thus, to read out a brain containing 1,015 bits would take 100,000 seconds, or about a day.

The turtle-predators had approximately the same capacity. Indeed, there were theoretical arguments that a mobile, intelligent species would carry roughly the same load of stored information as a human could. For all its limitations, the human brain has an impressive data-store capability, even if, in many, it frequently went unused.

The Circular Ocean had sent discrete packets of information of about this size, 1015 bits compressed into its powerful millisecond pulse. The packets within it were distinct, well bordered by banks of marker code. The representation was digital, an outcome mandated by the fact that any number enjoys a unique representation only in base 2.

Within the laser's millisecond burst were fully a thousand brain-equivalent transmissions. A trove. What the packets actually said was quite undecipherable.

The target was equally clear: a star 347 light years away. Targeting was precise; there could be no mistake. Far cheaper, if one knows the

**In concert—for the true living entity was the grove,
comprising perhaps a million trees—they reacted.**

recipient, to send a focused message, rather than to broadcast wastefully in the low-grade, narrow bandwidth radio frequencies.

Earth had never heard such powerful signals, of course, not because humans were not straining to hear, but because Shiva was ignoring them.

After Badquor's

death and Lissa's narrow escape, *Adventurer* studied the surface with elaborately planned robot expeditions. The machines skirted the edge of a vast tile-plain, observing the incessant jiggling, fed on the piezoelectric feast welling from the crusted rocks.

After some days, they came upon a small tile lying still. The others had forced it out of the eternal jostling jam. It lay stiff and discolored, baking in the double suns' glare. Scarcely a meter across and thin, it looked like construction material for a patio in Arizona.

The robots carried it off. Nothing pursued them. The tile-thing was dead, apparently left for mere chemical processes to harvest its body.

This bonanza kept the ship's biologists sleepless for weeks as they dissected it. Gray-green, hard of carapace, and extraordinarily complex in its nervous system—these they had expected. But the dead alien devoted fully a quarter of its body volume to a brain that was broken into compact, separate segments.

The tile-creatures were indeed part of an ecology driven by electrical harvesting of the planetary energies. The tiles alone used a far higher percentage of the total energetic wealth than did Earth's entire sluggish, chemically driven biosphere.

And deep within the tile-thing was the same bone structure as they had seen in the turtle-like predator. The dominant, apparently intelligent species had not gone to the stars. Instead, they had formed the basis of an intricate ecology of the mind.

Then the engineers had a chance to study the tile-thing, and found even more.

As a manifestation of their world, the tiles were impressive. Their neurological system fashioned a skein of interpretations, of lived scenarios, of expressive renderings—all apparently for communication outward in well-sculpted bunches of electrical information, intricately coded. They had large computing capacity and ceaselessly exchanged great gouts of information with each other. This explained their rough skins, which maximized piezo connections when they rubbed against each other. And they "spoke" to each other through the ground, as well, where their big, crabbed feet carried currents, too.

Slowly it dawned that Shiva was an unimaginably huge computational complex, operating in a state of information flux many orders of magnitude greater than the entire sum of human culture. Shiva was to Earth as humans are to beetles.

The first

transmissions about Shiva's biosphere reached Earth four years later. Already, in a culture more than a century into the dual evolution of society and computers, there were disturbing parallels.

Some communities in the advanced regions of Earth felt that real-time itself was a pallid, ephemeral experience. After all, one could not archive it for replay, savor it, return until it became a true part of oneself. Real-time was for one time only, then lost.

So increasingly, some people lived instead in worlds made totally volitional—truncated, chopped, governed by technologies they could barely sense as ghostlike constraints on an otherwise wide compass.

"Disposable realities," some sneered—but the fascination of such lives was clear.

Shiva's implication was extreme: An entire world could give itself over to life-as-computation.

Could the intelligent species of Shiva have executed a huge fraction of their fellow inhabitants? And then themselves gone extinct? For what? Could they have fled—perhaps from the enormity of their own deeds?

Or had those original predators become the tile-polygons?

The *Adventurer* crew decided to return to Shiva's surface in force, to crack the puzzles. They notified Earth and descended.

Shortly after,

the Shiva teams ceased reporting back to Earth. Through the hiss of interstellar static there came no signal.

After years of anxious waiting, Earth launched the second expedition. They too survived the passage. Cautiously they approached Shiva.

Adventurer still orbited the planet, but was vacant.

This time they were wary. Further years of hard thinking and careful study passed before the truth began to come.

L.

[—John/Odis/Lissa/Tagore/Cap'n—]

—all assembled/congealed/thickened—

—into a composite veneer persona—

—on the central deck of their old starship,

—to greet the second expedition.

Or so they seemed to intend.

They came up from the Shiva surface in a craft not of human construction. The sleek, webbed thing seemed to ride upon electromagnetic winds.

They entered through the main lock, after using proper hailing protocols.

But what came through the lock was an ordered array of people no one could recognize as being from the *Adventurer* crew.

They seemed younger, unworn. Smooth, bland features looked out at the bewildered second expedition. The party moved together, maintaining a hexagonal array with a constant spacing of four centimeters. Fifty-six pairs of eyes surveyed the new Earth ship, each momentarily gazing at a different portion of the field of view, as if to memorize only a portion, for later integration.

To convey a sentence, each person spoke a separate word. The effect was jarring, with no clue to how an individual knew what to say, or when, for the lines were not rehearsed. The group reacted to questions in a blur of scattershot talk, words like volleys.

Sentences ricocheted and bounced around the assembly deck where the survivors of the first expedition all stood, erect and clothed in a shapeless gray garment. Their phrases made sense when isolated, but the experience of hearing them was unsettling. Long minutes stretched out before the second expedition realized that these hexagonally spaced humans were trying to greet them, to induct them into something they termed the Being Suite.

This offer made, the faces within the hexagonal array began to show separate expressions. Tapes of this encounter show regular facial alterations with a fixed periodicity of 1.27 seconds. Each separate face ratched, jerking among a menu of finely graduated countenances—anger, sympathy, laughter, rage, curiosity, shock, puzzlement, ecstasy—flickering, flickering, endlessly flickering.

A witness later said that it were as if the hexagonals (as they came to be called) knew that human expressiveness centered on the face, and so had slipped into a kind of language of facial aspects. This seemed natural to them, and yet the 1.27 second pace quickly gave the witnesses a sense of creeping horror.

High-speed tapes of the event showed more. Beneath the 1.27 frequency there was a higher harmonic, barely perceptible to the human eye, in which other expressions shot across the hexagonals' faces. These were like waves, muscular twitches that washed over the skin like tidal pulls.

This periodicity was the same as the tile-polygons had displayed. The subliminal aspects were faster than the conscious human optical processor can manage, yet research showed that they were decipherable in the target audience.

Researchers later concluded that this rapid display was the origin of the growing unease felt by the second expedition. The hexagonals said nothing throughout all this.

The second expedition crew described the experience as uncanny,

Continued on page 95

BY KAREN HABER

Science fiction and classical art don't seem to have much in common unless you consider the work of Donato Giancola. While depicting visions of the future, he keeps looking back over his shoulder at the work of such great classical artists as Rembrandt and Hans Memling. A Chesley-award recipient, Donato credits the old masters with inspiring him to create paintings whose audacious composition, brilliant color, and dizzying perspective have delighted art directors and book buyers.

As bestselling SF novelists have learned, everything goes better with Giancola.

REMBRANDT



REBORN

"The day I
graduated I
had to compete
with Michael
Whelan & Darrell
Sweet, with all
of these artists
I admired."



Donato's work has been further enriched by the cultural wealth of his adopted city, New York, where he can gorge on the artwork hanging in the world-class museums. "I really believe in looking at other artists," he says. "Their craft, their ideas. Being able to stand in front of a 15-foot painting instead of flipping through a catalog."

Like many successful artists, Donato demonstrated his gifts early. "I must have been drawing ever since I was little—my first paintings were probably cave paintings in my mother's womb." From the age of six he drew tanks and aircraft based on the war comics he read and models he made. A huge roll of paper—the gift of his uncle—enabled him to draw epic pictures, 30- or 40-foot-long battle scenes, with his younger brother, Dave.

Science fiction entered his life with the *Star Wars* movies. "*Star Wars* was a big influence," he says. "*The Empire Strikes Back* was the

movie for me. Chills went up and down my spine each time I saw it."

Around that time the seminal role-playing game, *Dungeons and Dragons*, made its debut and Donato was quickly hooked. "I was a gaming addict. I started off with D&D and, later, *Traveler*. Then we modified the rules, increased spells, etc. Finally, we came up with our own game. I would make my own map grids—even my own grid paper. I wasn't happy playing in somebody else's imagination."

His older brother introduced him to J.R.R. Tolkien's *The Hobbit*, and from there he immersed himself in the literature of sci-fi and fantasy. However, science fiction—and art—were only hobbies. Donato had to be practical about selecting an occupation. "I grew up in Vermont, where artists were people like Rembrandt, not people from my community."

He began to study electrical engineering. Despite a real talent for math he grew restless with his major and found he was more



*PREVIOUS SPREAD: The cover of Brian Stableford's **Inheritors of Earth** is a tour of tomorrow. LEFT: Giancola's cover to Barbara Hambly's **Mother of Winter** invites the reader into a strange, new world. BELOW: A SF Grandmaster appears to consider the universe in Stephen Baxter and Arthur C. Clarke's story "The Wire Continuum," from the January 1998 issue of **Playboy** (© Playboy Enterprises 1998).*

interested in his mechanical drawing classes. Mid-term, he dropped his engineering curriculum, and when the dust had settled was enrolled in the painting program at Syracuse University. "I was aiming for their illustration program but got into their painting program instead. And it's affected every creative decision I've made since."

"Studying painting really opened my mind up to the way we make art. I got to learn about abstraction, about art history, composition, color, and narrative story-telling. Meanwhile, I was part of a comic book club where we self-published our own books. That's where I indulged my love of science fiction. But most of my classwork was serious."

Donato knew that soon he would have to qualify for more than the campus comic club. "The day I graduated I had to compete with Michael Whelan and Darrell Sweet, with all of these artists I admired. It was that kind of market. So I was always working toward that deadline."

Through Syracuse University he made contact with the professional illustration world, meeting artist representatives at portfolio previews. Donato quickly obtained representation and, diploma in hand, moved to New York to be closer to the action. But the real work was just beginning.

By day he toiled at the Society of Illustrators. At night he would work long hours—





"I want to be
able to meld
the idea of
abstraction
with the reality
of what I'm
going to make."

sometimes until dawn—to provide samples for his rep, hoping that one would do the trick. Finally he got an assignment from Wal-Mart: paint new covers for the classic sci-fi novels *The Time Machine* by H.G. Wells, *Journey to the Center of the Earth* by Jules Verne, and *A Connecticut Yankee in King Arthur's Court* by Mark Twain. He was on his way.

Nearly 10 years and several awards later, Donato has become increasingly interested in art for art's sake. "I'm focusing on quality now, not quantity. TOR [publishers] has allowed me a lot of freedom. I'm exploring figures and compositions. Whenever I do a wraparound I forget about what's going to

happen to it as a cover. I used to give art directors exactly what they requested: commercial problem-solving. But that's not what I got into art for, and I don't know if I'll always want to have to deal with that."

Although he admires computer-generated art, he says it's not for him. "Drawing is what dictates my artistic choices. I want to be able to meld the idea of abstraction—pure gesture—with the reality of what I'm going to make.

"I rarely use any vanishing point perspective. It's the cubist influence: fracturing the vectors. I watch for strange overlaps or foreshortening. I'm very, very conscious of composing my pictures along a two-dimensional





FAR LEFT: The artist's special touch with the alien is shown in David Brin's *Otherness*.

CENTER: The cover to Emily Devenport's *Eggheads* predicted a gleaming future.

LEFT: Simon Green's *Deathstalker IV: Honor* showcased Giancola's painting "Omega Corps."

The mirrored tour-de-force of *A Construct of Time* (for the novel *Shadows Fall* by Simon Green, Penguin) came about by chance. "All I got for that assignment was a brief description: a robot made of watchparts. The original idea was to have him be brushed chrome. So I painted the backgrounds, using basic complements. I started to work on the face, and thought I would make his helmet reflective. Once I had the pattern on the head, I saw that I could mimic it all over the figure. That was a fun painting."

He relies upon photographic references for the actual figures, either posing and shooting them himself or using professional photographers and models. In the cover painting for *The Queen of Demons* (David Drake, TOR), Donato photographed fellow artists Stephen Youll, Steve Ellis, and Dorian Vallejo as models for a tricky bit of action. "They're on the far right of the painting: that's Stephen being tackled by Steve, and breaking through the stair railing as Dorian swings a mace nearby." The artist also makes an appearance in the painting as the bearded figure on the stairs. "I'm the only one who's not engaged in combat, just watching."

Donato works at home in his top-floor studio, teaches at the School of Visual Arts, and has curated an exhibit at the Society of Illustrators. In addition to the Chesley Award for best paperback cover, 1996, he has received a silver award from *Spectrum II: The Best of Contemporary Fantastic Art*, and the Jack Gaughan Award for Best Emerging Artist at Boskone 35 in 1998. That same year Donato was Artist Guest of Honor at Lunacon, where he received Best of Show and Best Professional Artist awards.

He enjoys the awards but says he's in it for more than the accolades—or even the paycheck. "Craft comes first," Donato says. "I'm concerned with making a nice painting. It has to work for me as an object—a painting—before it can work for an art director as a cover." ■

layout. That helps them read graphically." In *Ravengers* (Warner Books), the fractured vectors keep the viewer's eye moving over the dizzying multilevel cityscape.

In addition to his work for publishers and private clients he also paints cards for *Magic: The Gathering*, *Dune*, and the *Middle Earth* card games. "Cards are fun because you don't have to worry about text, but they're small so you have to simplify the compositions, which is directly opposed to my goal for the book covers."

Included in his "mission statement" is a determination to alter the "babes-in-bras" and "heroes-in-battle" formulae of fantastic art. "I want to break the stereotypical icons

of the genre. I'm trying to make males look heroic through body language or lighting without being in conflict. And I prefer to use untypical models."

In *Mother of Winter* (Barbara Hambly, Ballantine) Donato achieved several goals. "I really pushed for the right to do a beautiful elderly woman on the cover. And I appropriated the curvilinear patterns of Islamic art to tie the painting together, overlaying the image and integrating it. So I was able to meet the publisher's needs for an attractive subject, and mine as well." (A science note here: The machinery Donato depicted in this work is a detail from the Babbage analytical engine, a precursor of the computer.)

THE MEC

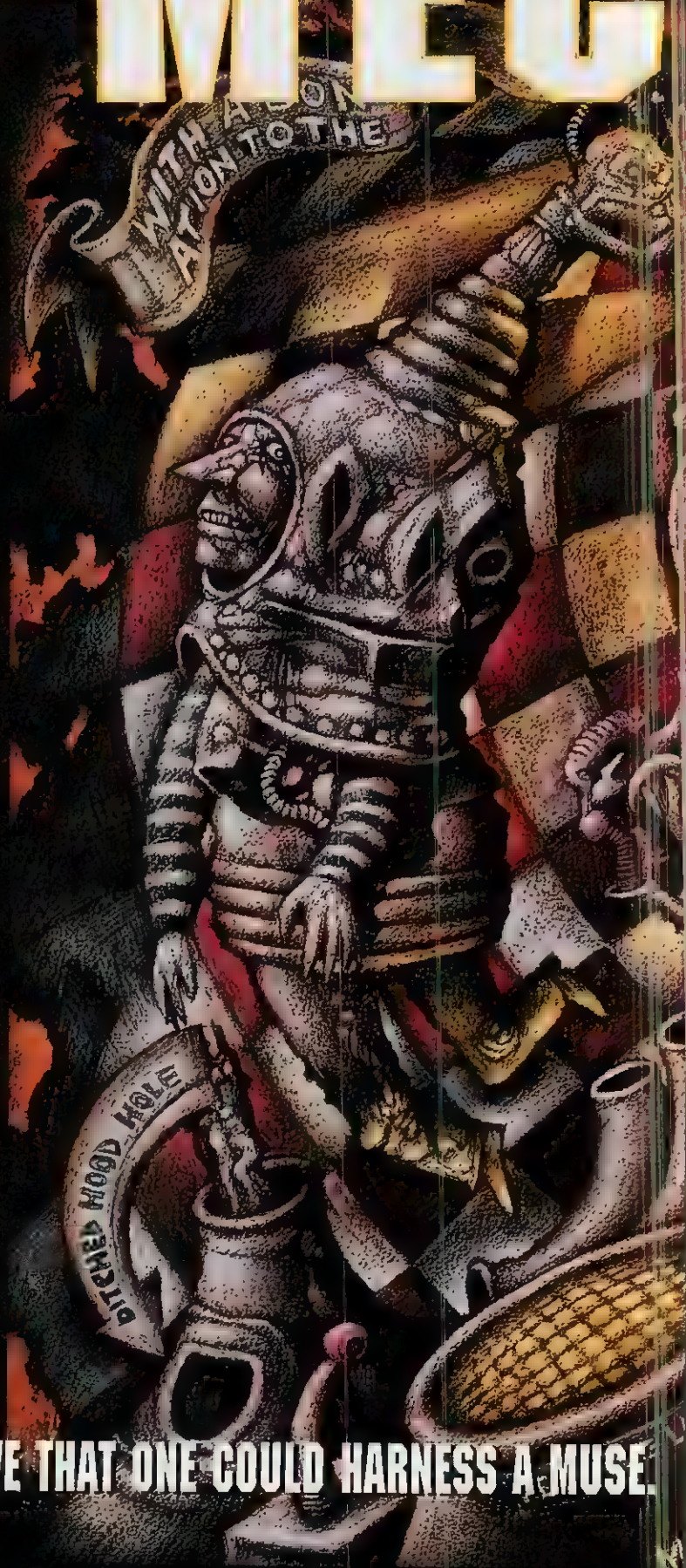
IT IS A SIGN of a natural essayist's fame, or at least notoriety, when he begins to receive the occasional invitation to seances, breakfast symposia, or to farming collectives that have seen a sudden surplus of two-headed chicks or she-goats that give vinegar instead of milk. It is less a blessing than a curse, the phenomena either (as in the case of the farm deformities) commented on *ad nauseam* by others long ago, or as is common with the paranormal, entirely refusing to present themselves under the spotlight of scientific scrutiny. And how often does the monetary honorarium promised for a lecture prove itself to be a tin medal or nothing more than a fruit salad and a cup of tea!

BY DAVID IRA CLEARY

ILLUSTRATION BY

CHRIS MARS

JAROMIR STAVAN DID NOT BELIEVE THAT ONE COULD HARNESS A MUSE.



HANICAL GERMANIA



JUAN DE BINGO WAS ABOUT TO PROVE HIM WRONG.

It is thus with little enthusiasm that I read the following:

Jaromir Stavan:

You Surely would Remember me, as you honored me with your Analysis last year of my Cerebral Insulator; and now, as your kind and Insightful words have brought me and the world of Knowledge much profit, I would Hope you would let me Honor you in Return. Specifically, I would like to invite you to Old Chutney, my Estate outside Adroque, as a Visiting Scholar. I would pay you a Cash Stipend of four hundred pesetas per Week, as Well as supplying you with Room and Board, and offering you the resources of the library at Old Chutney. Additionally you would Enjoy the discourse of several other Esteemed Scholars currently in Residence, and have the Opportunity of observing several investigations I have lately been pursuing toward the perfection of a Mechanical Grammar.

Do Consider my proposal; I Anxiously await your reply.

Juan de Bingo, MS, PhD, MD, DDS, DD

BINGO'S INVITATION WAS LAUGHABLE, NOT ONLY FOR ITS ANTIQUATED STYLE, BUT FOR THE OBTUSENESS THAT IT MADE EVIDENT: I HAD NOT PRAISED HIS "CEREBRAL INSULATOR" BUT SHARPLY CRITICIZED IT. The Insulator, a lead-lined suit purported to shield artists from the promptings of their Muses, in fact merely left them too uncomfortable to work. It was a case of heat stroke, not the suit per se, that prevented the virtuoso I had observed from completing a single measure of a sonata over the length of an afternoon. That was my conjecture, at least. As Bingo presented no control subject, any suggestion regarding the role of the composer's Muse must be conjectural.

Probably Bingo had not even bothered reading the essay. A man busy accumulating such a list of degrees would have no time for such a chore. I was about to discard the invitation when I noticed its postscript: a list of the scholars in residence. Most I did not recognize but one I did. Monij.

Evaristo Berrenz Monij.

My famous colleague, who could call a raindrop a deluge, a case of sniffles a plague; who sought the sensational and the sordid; who emended the truth and invented phenomena where none existed. Without a responsible voice to balance his extremes only fantasies would emerge from Old Chutney.

I took a sheaf of paper from my desk drawer and began writing my acceptance letter to Bingo.

JUAN DE BINGO MET ME AT THE TRAIN STATION IN ADROQUE. HE WAS AS DAPPER AS I REMEMBERED HIM—SOLIDLY BUILT, FLORID OF FACE, GRAY BEARD NEATLY TRIMMED. HE WORE A GRAY ERMINE SUIT WITH A BLUE SATIN VEST. HE HELD OPEN A LARGE, leather-bound volume, from which he appeared to read as he said, "Five minutes late, Stavan."

"I hope you'll blame the railway, and not me," I said.

He turned some pages in the book. "We are all responsible for these costly mistakes."

I was saved from having to reply by a young man wearing a green cap, whom I recognized as a porter in Bingo's employ. "I'll carry these for you, sir," he said, picking up my valise and travel case.

"To the carriage," Bingo said.

The "carriage" proved to be a large steam-driven car, with a brass-plated cabin and, at its rear, a coal-fired engine complete with a water tank, furnace, and wrought iron smokestack. Five years ago such a machine would have been a delightful novelty. But now, with the ascendancy of the diesel engine, it seemed another illustration of Bingo's foolishness.

After securing my luggage the porter climbed up to the platform behind the cabin to tend the furnace. Bingo himself drove the car, pulling at the steering straps and pushing various floor pedals while balancing the open book on his lap. "Kings will one day know the comfort of coal, Stavan!"

"Undoubtedly." I strove for delicacy. "Tell me, Dr. Bingo—have you scripted out in advance our conversation?"

I immediately regretted the question. Bingo began flipping through

pages in the book, his left hand only pulling on a steering strap and the car, inevitably, drifting leftward. A horse-drawn wagon was coming from the other direction. "Bingo!"

"A script is no better than its orator."

The street was narrow, the horses frightened. I pulled hard at the right steering strap, averting disaster but not entirely preventing a collision: The left side of the car tore off a panel in the wagon, and its contents, white round vegetables of some sort, began spilling out.

Bingo stopped the car, glanced at the driver of the wagon, a mustachioed man who seemed on the verge of tears, then pulled open his purse and took from it a handful of peseta notes. He handed the notes to the porter who in turn conveyed them to the wagon driver. Bingo flipped unhappily through his book for a moment. "Unsatisfactory."

"We're lucky no one was hurt," I said.

"I mean this." He shut the book. "It didn't work."

"I would think that your command of our native tongue would make a phrase book superfluous."

Bingo only laughed.

The porter came up beside the car. "The man was satisfied with the arrangement, sir. He gave this to show his good will."

I was commissioned to hold the gift: a bag containing some two dozen of the vegetables or, more precisely, small dessert cabbages, boiled in honey then rolled in powdered sugar. Although science has demonstrated they have no medicinal qualities, I can attest they make excellent snacks.

We drove on, Bingo's eyes on the road. I wiped sugar off my fingers then looked through Bingo's book. It was a phrase book of sorts, entries arranged alphabetically under headings such as Babies, Cats, Deliberation, Enthusiasm, and so on. The organization seemed sensible enough. But the entries beneath each heading seemed less so; some were cryptic ("The enthusiast sheds her willing fleas"); most were nonsensical ("Enthusiastic tables preserve delirium") An occasional entry expressed some banal truth. I marveled that Bingo had been able to find anything remotely appropriate to say when he had been consulting his book.

"See the flaw in the book, Stavan?"

I chose my words carefully; Bingo was, after all, my benefactor, and there was no point in injuring his pride. "Some proofreading might be in order."

"Proofreading?" His voice was incredulous.

"Cross references?"

"I'm amazed, Stavan. *You*, of all people, should—" he struggled, for a moment, for the right word—"should see what the book needs."

I told him I did not.

"A Muse, Stavan. A creative *thing*. The Mechanical Grammar has been unsatisfactory because no Muse has been—" He pulled on both steering straps, again apparently struggling for a word.

"—harnessed to inspire it."

Taking a sugar-cabbage in hand, I said, "But you propose to harness a Muse?"

He nodded in affirmation. "And you shall chronicle my attempts."

BUT OF COURSE I WAS NOT TO BE THE ONLY CHRONICLER. THE SUN WAS LOW IN THE WEST WHEN WE REACHED OLD CHUTNEY. BINGO'S MANSION WAS HIGH IN THE FOOTHILLS OVERLOOKING Adroque: From the vantage, the tree-lined streets of the city, laid out as regularly as possible given the hilly terrain upon which it was built, looked like the whorls of a fingerprint. The air was crystalline, and the buildings seemed to sparkle in the soft light of the early evening.

Bingo's mansion, too, seemed resplendent: three stories tall and built of white-washed brick, it was almost luminous. The wings of the building were capped with burnished turrets in the Patagonian style, lending the structure an atmosphere of historical import. As Bingo led me through the ivy-covered trellis sheltering the footpath running alongside the building's north wing, it occurred to me the setting might indeed prove conducive to productive work.

That optimistic flow of thought was quickly tempered. As we came around to the gardens at the rear of the mansion, I saw the other

"THIS IS VITAMIN JUICE. WHO WOULD NEED A

CHEMICAL STIMULANT WHEN THE IDEAS HERE ARE THEMSELVES SO INTOXICATING?"

scholars Bingo had invited. I recognized too many of them: a sal-low-faced young man who had failed an introductory geology course I had taught several years ago; a middle-aged gentleman who had once brought to my office a machine he claimed would act as a counter to the aging process by transporting through time the younger version of the self (he succeeded only in catching his hair on fire when he demonstrated the machine's effects upon his head); and two elderly women who often attended my lectures and whom I had dubbed the Atopical Twins, because of their habit of asking questions irrelevant to the matter at hand. And at the center of a circle of five or six no doubt equally estimable scholars stood Evaristo Berrenz Monij.

It has long been my contention that Monij compensates for his height (or lack of it, for he stands at only a meter and a half) with his inflated prose. His manner, too, seems a recompense for his stature. I had scarcely stepped upon the long verandah where the scholars were gathered before Monij rushed to my side, cried out my name, and gave me a vertebrae-cracking hug. "I'm glad you've come, Stavan. Your sober analysis will corroborate my own."

"Which isn't so sober?" I said. Monij wore a gleaming black bowler, from under which a clear tube descended like an inverted umbrella handle toward his mouth. He laughed, then sucked on the tube, drawing a green fluid from a container held within the hat. "This is vitamin juice. Who would need a chemical stimulant when the ideas here are themselves so intoxicating?"

I took a glass of red wine from a tray. "A tankard of cheap beer would be more stimulating than the ideas in Bingo's Phrase Book."

"Mr. Monij, I need your eloquence."

It was Bingo. He had been with the Atopical Twins, but had drifted toward me as I talked to Monij. I took a vigorous swallow of wine, to conceal my embarrassment. I had not meant to speak so sharply within his earshot.

Monij said: "It is not the ideas *within* the Phrase Book that are so stimulating. It is the idea *behind* it that amazes. From the—"

"No," Bingo said. "Not just for the professor. For the group. Indoors, near the Grammar."

"An excellent suggestion!" Monij scampered to the edge of the verandah and leaped up onto the rail. "Everyone! Let's meet inside! An impromptu lecture shall be given!"

THE SCHOLARS WERE HERDED INTO A SMALL THEATER CHAMBER, BLACK STAGE CURTAIN HANGING AT ONE SIDE, THE FEW CHAIRS AVAILABLE IMMEDIATELY OCCUPIED AND MOST, INCLUDING MYSELF, forced to stand. Bingo stood with us, tapping his foot nervously. The close quarters, the warm air, and the motion behind the curtain put me in mind of evenings spent at the Minister of Science's mansion, dutifully listening to his daughter play the bugle.

At length Monij pushed out from behind the curtain. He carried a cane carved from a war-whale's tusk.

I had not expected the man to be a disinterested observer. I knew he judged the merits of a phenomenon by the pesetas it might earn him. But still I had hoped him to be something more than Bingo's mouthpiece.

"When the educated man sits down for his breakfast," Monij said, "he is confronted immediately by the many Wonders of the Modern age. The light above his head is produced by an electric current crossing through a carbon filament in an evacuated bulb. The eggs which lie chopped in a bowl before him have been hard boiled in water conveyed kilometers by an underground lead pipe, and heated over a flame fueled by gas similarly conveyed. The vitamin juice with which the man washes down his eggs has been prepared according to the latest scientific principles of goodness and nutrition..." Monij listed a dozen other Wonders, from stainless-steel nose-hair clippers to the hydro-thermal slippers favored by engineers, before coming to his point. "But what in this happy

scene is not astounding? What accouterment at the man's disposal would be familiar not only to his father, but to his grandfather as well? Why, it is the very instrument that announces the progress of our society through time, the ragweed herald of the day's events and the morrow's Wonders. The Newspaper!"

A shiver went through the small audience; Monij, flushed, it would seem, by his performance, paused to take some juice from his hat, still on his head. Then: "And I mean not the paper itself, produced by our textile mills using the latest technologies, nor the ink on that paper, laid there according to the molten promptings of the latest-model Lithographizer, but the sentences themselves! The word-by-word accumulation of meaning, the phrase-by-phrase aggregation of significance! All of which though cast by metal and despite our tremendous advances still originate the way they did a century ago: the verbal expression of Conscious Man's thought!"

"Wouldn't they use a typing machine nowadays?" someone whispered.

I laughed; it was one of the Atopical Twins. But Monij pointed his cane at me. "You titter, Stavan. But the words with which you populate your essays come to your head in the same time-worn manner! As they do to every man—the research, the outlines, the daydreams, the pacing, the approximating of the true thoughts with their clichéd counterfeits! Or do you claim a different route to your success? A spelling spell, a prose potion?"

"I claim nothing but my own hard labor."

"Labor will be unnecessary in the future," Bingo said, reading from his book. There was an edge in his voice that I took for impatience with Monij's slow delivery. Bingo, who was standing stage-left near the end of the curtain, activated a switch in the wall and said, "Explicate."

The black curtain rose.

Behind it was the Mechanical Grammar.

The Grammar consisted of some two score glass cylinders, each three meters tall and a meter in circumference, connected to others by much narrower tubes, and containing up to a thousand marble-sized sponge-wood spheres. Each cylinder contained spheres of only one color, and each color corresponded to a different part of speech: yellow to articles, blue to nouns, green to verbs, red to adverbs, and so forth. On each sphere was printed a word of its class. "The entire lexicon of our great language," Monij explained, "with a distribution weighted slightly to words of greatest profundity." A steady stream of air blasted upward in each cylinder, suspending the spheres in a constant flux: The balls tapped the glass like ice pellets against a windowpane. Near the top of the cylinder was a vent that could be electrically opened or closed. Once opened, a sphere was discharged, to roll down, depending on its weight, one of several tubes connected to other cylinders. Arriving at a second cylinder the sphere would activate a circuit opening a vent in that cylinder and discharging another sphere; meanwhile, the first sphere would roll down to a desk-sized apparatus at the front of the Grammar, called the Ledger. In theory the process could continue indefinitely, for many tubes fed back to cylinders which might have previously discharged spheres. In practice, the process was limited by the number of spheres the Ledger could accommodate.

Other limitations were soon made evident.

"Demonstrate!" Bingo cried.

Monij activated a green switch in the panel at the base of the Ledger. Spheres shot out in quick succession: *wooshing* as they escaped their containers, rather flying down the tubes than rolling, triggering the next ejection before the eye could identify the color of the first. All was a blur; and I must confess having felt for a moment the admiration the uneducated bestow on pretty, well-oiled mechanisms they do not understand. But the Grammar

proved not so well-oiled. After four or five seconds of *wooshes*, a loud and irritating whistle was heard as spheres ceased to fly. "Noun Four," Bingo said; one container had released two spheres simultaneously; they had jammed the release vent, preventing it from closing. Monij flipped a red switch on the Ledger. The whistle stopped, and the blue spheres fell. As did the spheres in all the containers; the air-thrust was ended, the demonstration complete.

Seventeen spheres lay aligned in the collection groove at the bottom of the Ledger. I moved forward to examine the sentence. "The Ledger makes it easy for you," Monij said, activating a yellow switch on the panel. A bright light came on within the box and, by means of a system of mirrors and lenses like that in a reflecting microscope, the sentence was projected onto a white panel extended on top of the Ledger. It read:

The bold fruit theology succumbs instantly beyond the sanguine perfunctory limits of our lucid time's ethos of

That such an impressive mechanism would produce such drivel was disheartening. But I tempered my comment. "The sentence appears ungrammatical."

Monij tapped my head gently with his cane. "A niggling insistence, Stavan, to see the superficial and miss the deep. One missing noun is all that separates this sentence from grammatical integrity. Would you refuse a painting by an Old Master because of a chip in its frame?"

"This is hardly—"

"—the work of an Old Master? We'll leave posterity to judge that. For now, let's consider the deeper implications of the Grammar. Its utility is vast, its potential astounding. All possible sentences can be created, all combinations of words can be generated; novel ideas that might never be invented by human reason, constrained as it is by biology and breeding—can by the Grammar be instantly produced. Even this modest sentence contains wonders." Monij sucked from his hat and tapped the first phrase. "'Bold fruit theology.' What a gem for the philosopher or ecclesiastic! A metaphor for the beliefs of daring eccentrics or, alternatively, an entire belief *system* founded on the worship of grapes and pomegranates! And for the poet!" (tapping on 'lucid time's ethos') "A glorious conceit granting the passage of the day's personhood and concomitantly both level-headedness of vision and a moral code!" Monij paused and studied his audience. "Could the human mind invent these phrases? Perhaps. But consider the labor required. How much better for the priest or poet to leisurely acquire them by perusing the phrase book of the Grammar!"

"The Editor," Bingo said. "Introduce it."

Monij hesitated. I realized then that he was not merely Bingo's mouthpiece. Rather he was a sermonizer, praising a god before those who already believed. And that his praise had consisted of ritual invocations was only now becoming evident: As he sucked on his straw, his audience became restless. They fidgeted, coughed, glanced at their pocket watches, engaged in the nervous activities common to those who have been denied some chant or formula to complete a ceremony.

"The Editor," Bingo said impatiently.

Monij bowed. He again flipped the yellow switch on the Ledger, sending the spheres that had been collected into a container called the Outflow Bin. Then he went stage-right of the theater. A small door, which I had taken for the entrance to a mop-closet, proved to be the entry to a larger room. Monij went inside, waving his cane for us to follow. I was among the first.

The room had five wooden chairs and a startling decor: Mirrors covered to completion the walls, ceiling, floor, and even the surface of what I took to be a fireplace. The mirrors were oddly warped: My distorted reflection in the opposite wall paid no compliment to my girth. I kept my sense of humor. "You keep a funhouse at Old Chutney?"

Bingo did not smile. "Enlighten Stavan," he said to Monij.

"This is the Editing room," Monij said.

One of the Atypical Twins clutched the sleeve of my jacket; the whispers of the others in the room were charged with agitation; clearly the continued disruption in the crowd's routine was not to its liking. But just as clearly Monij was addressing his comments to me:

"Although most sentences the Grammar creates are laudable for

their insights, occasionally a disappointment slips through. A sterile phrase is dropped, a dull platitude presented. Not all combinations can be clever. But this is to be expected." Monij pointed his cane at me. "Those of a scientific bent know the Law of Averages must be obeyed."

If he thought to impress me he did not; his mention of that fatuous Law only demonstrated his uncertain grasp of probability.

"Providentially, Dr. Bingo has constructed this Editing room to further reduce the probability of a nonsensical combination. Of what does an Editing room consist? Of five chairs, manned by five Editors, each of whom wields not a red pencil but rather a tool as revolutionary as the Grammar itself. I speak of the Cerebral Insulator!"

My groan was lost against the excited din of the crowd.

"Yes—the Insulator!" Monij poked the wall behind the chairs with his cane. A spring mechanism was engaged; a long mirrored panel folded open, and a large drawer slid out almost to the chairs. The drawer held five outfits, neatly folded, each with a matching helmet. "Stavan," Monij said, "would you care to don a suit so I might have a worthy paradigm to illustrate the concept?"

"I'd rather not."

Bingo frowned. But one of the scholars came forward, and was soon dressed in a suit. I judged the design an improvement over the one I'd seen two years previous, at least in aesthetic terms. What had looked like long underwear now seemed like close-fitting armor; the full helmet with its grilled visor seemed frankly chivalric.

Monij said: "Human beings, for all their defects as agents of creation, possess one quality in their favor: the creative spark which sets to flame the brambles of habit, the thickets of stereotype. What is the stimulus for the Heat Lightning of the Human Mind? What is the prod to productivity?" Monij looked at me. "It is called the Muse."

WILL SPARE THE READER THE SOPHISTRY THAT MONIJ DELIVERED WITHOUT APPARENT EMBARRASSMENT. SUFFICE TO SAY BINGO CONCEIVED OF THE MUSES AS THE INHABITANTS OF AN INTELLECTUAL PLANE COMPOSED OF ETHER AND coincident with the Earthly Sphere. A Muse is attracted to the electrical fields produced by the creative brain at work; if there is sufficient sympathy between the brain and the Muse, it will enter the brain, and by means of an Attractor Valence, increase the firing rate of the neural cells, thereby enhancing the creative impetus. The logic is faulty, the science absurd, but the scholar courageous enough to accept the premise must also accept its corollary—that a Muse that can enter a brain can also be prevented from entering that brain. The scholar must accept perforce the Cerebral Insulator. The scholar can only choose to believe that a lead-lined suit can deny a Muse admittance to its target brain.

But who could swallow the ensuing premise?

"You will note," Monij said, tapping the shiny helmet on the subject's head, "the layer of polished nickel that has been affixed to the Insulating Suit. You will note too the same bright material affixed to the walls and floor and ceiling. And finally you will notice the large concavity built into the wall and also surfaced with bright nickel. All this brightness has a function: it integrates the Muse with the Mechanical Grammar!"

"Can I sit?" asked the subject.

Monij nodded. The man sat on one chair. Monij climbed onto the chair beside him. He looked pleased to be taller than his audience. "Integration happens this way: the wearer of the suit—the *Editor*—utilizing whatever meditative techniques he is accustomed to, enters the trance-like state requisite for creativity. Requisite but not sufficient; the Muse is still needed; and it is this enervated mental state that attracts the Muse. Or rather say Summons!—and the Muse will rush toward him. Although very likely the Muse will be outside Old Chutney, and as walls of brick or stone can retard the motion of the Muse, this room has been crafted to accommodate its motion." Monij raised his cane toward the ceiling. "This mirror is one-way only; it conceals a shaft open to the sky, and grants the observer from above a clear view of the room below. By the same token it allows the Muse easy access to the room, for glass is the solid most unlike lead."

I chewed on my beard to forestall a sarcastic comment.

"Now, having entered the Editing Room, the Muse proceeds like an arrow toward the Editor." Monij mimed the motion with his cane. "But hark! The insulating suit prevents its entrance, and the mirror-fabric acts as an Impetus Reflector, causing the Muse to rebound from the suit—whereupon it will reflect off one of the other surfaces of this room. Note the parabolic curve the walls together make. Their focus is the receiving vent." Monij jumped down from the chair and pointed at the aperture I had taken for a fireplace. But no fireplace has a flue projecting downward instead of up. Monij knocked his cane against the vent: The metal rang deeply. "The Muse is directed to the vent; the vent carries the Muse through the clear side of another one-way mirror and thence into the hot furnace beneath the Grammar. Here the Integration is accomplished: The Muse rises with the warm air from the furnace and enters the cylinders, where it exerts an electrical influence increasing the likelihood that a worthy word will be selected."

"I would think," I said, "that the problem would not be a shortcoming in a single word, but rather in the choice of several words together."

Monij glanced at Bingo. Bingo said: "The Muse spreads."

Monij puzzled over this phrase a moment then said, "A good point, Stavan, but one that betrays a certain naivete. For a Muse upon entering a brain does not increase the effectiveness of only one neural cell. No. It excites thousands. It kindles lobes. It galvanizes hemispheres. And similarly, the Muse enters into not one cylinder but many. It electrifies the entire Grammar simultaneously."

It was then that Bingo walked over to Monij. The two conferred in low voices for some minutes. While they talked, I spoke to the man beside me. "Monij certainly has a talent for giving the ring of truth to Dr. Bingo's fantasies."

The man stared at me. "These are not fantasies. These are revolutionary breakthroughs."

His voice was leaden, his tone without irony. Gullible—or greedy—he had assimilated Monij's sermon. He continued to stare at me and I looked away.

"Attention!" Monij had set his cane on his chair; now he held a small leather-bound notebook. "One Muse does not a library make. The charge to the Grammar it imparts will decay over time. The Muse may even escape despite the containment mirrors." He took a pen from a waistcoat pocket. "Conversely it is theorized that multiple Muses, entering the furnace together, will have not an additive effect but rather one of products. The theory merits testing. Therefore starting tomorrow we will have five Editors stationed in this room from dawn to dusk, in two-hour shifts."

He asked for volunteers.

In retrospect it is unclear whether the haste of the evening's proceedings was evidence of desperation on Bingo's part, or rather a demonstration for my benefit of the loyalty of the scholars. Perhaps it was both. At the time, however, I was conscious mostly of my status as the one skeptic in the room. It was with discomfort that I stood aside while the scholars formed a queue in front of Monij. It was with unease that I left the Editing room.

I almost let out a cry when Monij grabbed my coat tails.

"Stavan, won't you sign up? Won't you contribute your extraordinary Muse?"

"No," I said. I felt all eyes upon me. "The Editing room deserves at least one impartial observer."

each. The myth of the Muse-Driven Editing room, whose genesis I had observed that evening, would provide the first entry.

At about two in the morning I crept out of bed.

Old Chutney was quiet, its long hallways dark. I thought this further evidence of a conspiracy. Surely some scholar—if his enthusiasm wasn't feigned, his skepticism purchased—would, unable to sleep, turn on his desk lamp and scribe heated notes to himself, either excited proclamations of Bingo's genius, or horrified revelations of the ignoble truth. Surely I would not be the only insomniac here.

Nor did I see anyone in the library, though its two great electric chandeliers were lit, as were its study-table lamps. Earlier the porter had shown me the library, and I had been impressed by the number of volumes, by the fine oak stacks with their carved end panels, and by the portrait of Palejandro on the ceiling, the ancient sage studying the vortex shaped by his draining bathwater: the famed incident which tradition tells us inaugurated the science of hydraulics. Probably the painter exaggerated the musculature in the man (who had been close to 90), and I doubt water ever glowed. But the presence of the sage seemed a good omen for me, and I had to admire Bingo for his decorating sense as well as his decision to leave the lights on deep into the night.

I thought it telling that I was the only one of his scholars to put these lights to use.

But use proved harder than I'd anticipated. I'd hoped to find Courcier's *True Dictionary of Strange Events*, which might serve as a seed for my own projected volume, but I could neither find a card catalog nor fathom the organizational scheme of the library. Walking alongside a shelf seemingly devoted to waterfowl, the gastronomy of ancient tribes, and the architecture of churches and canals, I came upon several volumes by Monij. My competitive hackles raised. Here was *Des Profundis, A Journey of a Thousand Years, Pleasure Palaces of Forbidden Peoples*, and a score of other such fat and sordid volumes. There were multiple editions in both our tongue and others; Monij's poison has diffused beyond our shores. My heart sank as I saw the last places on the shelf were also devoted to his work. My only hope lay in the probability that the rest of his work was scattered throughout the library. I rounded the corner, hand on a carved Phrygian column.

And saw Bingo sitting in the next aisle.

"Sleepwalking, Stavan?"

I was wearing my nightshirt and sleeping cap: I had not thought to dress. "Studying your collection. And you?"

He had many books before him. Judging by the one title that I saw, and the pattern of missing and still-present books on the shelf to my left, all were by Monij. "Enriching my soul." He waved the volume in his hands at me. "Try."

"I have."

"But with—" Bingo frowned. Then he pointed at his head and opened his arms wide. "With . . ."

"With an open mind?"

He nodded an affirmative.

I said, "My mind is open in as far as I am willing to admit any hypothesis, given sufficient evidence and a reasonable argument." I reached into my pocket and pulled out a sugar-cabbage. "I have read Monij and found him often lacking in both requirements."

Bingo stared at me, his eyes dull, his mouth slack.

I said: "I mean, although Monij does have a fine mind, the volume of his production and his desire for fame may affect his judgment adversely."

Bingo stared at me a moment longer. "I had hoped, Stavan—" He paged through the book for a moment, "that you'd contribute your Muse."

"I think I can best advance your interests as observer."

Bingo picked up *Des Profundis* and began paging desolately through it. Watching his sad eyes look at the lurid illustrations, a worrisome thought occurred to me. "Good heavens, Bingo—did Monij give you the idea for the Editing Room?"

Bingo spoke within seconds.

"The idea is mine alone."

HAVE LONG BELIEVED THAT MYTHS ORIGINATE IN ONE OF TWO WAYS: EITHER AS THE NAIVE INTERPRETATIONS OF GENUINE PHENOMENA, OR AS THE EQUALLY NAIVE ACCEPTANCE OF A CHARLATAN'S DECEPTIONS. THAT NIGHT, WHILE attempting to fall asleep (the luxurious comfort of the bed itself proving a distraction to my slumber), I realized there was a third means by which myths might generate—as beliefs purchased by a fraud. How much of history, how many of our schoolroom lessons and celebrated fables, were inventions whose place in our culture was bought with pesetas? In the soft bed I conceived the notion of a great Encyclopedia listing all myths of questionable provenance and providing an analysis of the origins of

"HUMAN BEINGS, FOR ALL THEIR DEFECTS AS AGENTS"

IDID NOT TAKE BINGO AT HIS WORD. AFTER A FEW PLEASANTRIES I LEFT HIM, THEN, FROM THE NEIGHBORING SHELF, PULLED A FEW OF MONIJ'S BOOKS, WHICH I TOOK WITH ME TO MY ROOM. OF LATE I'VE OBSERVED I WORK MOST EFFECTIVELY WHILE eating; a well-done rump roast, or wheat bread slathered in buttercheese, can improve my productivity immensely. Fortunately, Bingo had provided a basket of foodstuffs, including dried fruit, cured raven wings, and more of the excellent sugar cabbages. I began to eat. By five in the morning I had finished the basket and skimmed through the four volumes. The food was superb, my gleanings negative. Monij did not, at least in these works, mention a Muse-driven Editing room, or indeed any matter relevant to the theory or functions of a mechanical grammar.

I was not disheartened. Dead-ends serve almost as well as discoveries to advance the cause of science. And Monij had written other books. I fell asleep with confidence that I would with the coming day understand the origins of the Muse-idea.

IT WAS WELL PAST 11 BEFORE I MADE MY WAY TO THE GRAMMAR. THE SCHOLARS WERE ALREADY CONVENED. AS I ENTERED THE THEATER CHAMBER THEY BEGAN TO CHEER. FOR A MOMENT I THOUGHT THEIR APPLAUSE FOR ME, but then I saw the Grammar was operational, and a bright sentence displayed upon the Ledger. *To shake awesome debts requires a faith in courage.*

Bingo stood by the Ledger. He was dressed in a white vicar's suit; his beaming face seemed almost as bright. The sentence was shorter than the monster I had seen yesterday, and it made a sort of sense. But it was hardly worth a huzzah.

Monij wore a black stovepipe hat that increased his height by half. "Note the compactness of the creation! The wizardry of its wit!" He drew his cane along the length of the sentence, words brightening momentarily as the cane touched them. "Like the best proverbs a volume binding together multiple aspects of the human experience: we see commerce in 'debts'; religion in 'faith'; the indomitable expression of free-will in 'shake' and 'courage.' All these elements made living by the Grammar!"

"Aided by a Muse?" I said.

Monij reached out and poked my belly with the cane. "Breakfast kept you away from my morning explication, Stavan?"

I laughed. "Research, rather."

"To save you further research: repetition!" He glanced at Bingo, then led me into the Editing room. The five chairs were occupied by Editors. An electric fan buzzed behind them. Each Editor held a bucket of ice in his lap and had a small container strapped to the top of his helmet, with a straw depending from it. I could not see how the water could be used without lifting up the visor. "Is a swallow of water worth the admittance of a Muse?" I asked.

"It's an acceptable risk, Stavan. No Muse will be drawn to an unconscious brain."

Monij named the Editors, explained that this was the second of the day's two-hour shifts, and led me back into the theater. Bingo looked at us, an anxious expression replaced quickly by one more placid, as though he had divined my suspicions but recognized Monij had dispatched of them. He said, "The next sentence, Mr. Monij?"

"Straight away," Monij said. He left me with the scholars then stepped over to the Ledger and activated the green switch with his cane. Vents opened, spheres *wooshed*, activation spread in a wave of colors whose complexity would impress only the naive. Then, a second of silence, followed by a faint fast series of taps, which I identified as the sounds of the spheres falling into the groove. The Grammar had finished its sentence without breaking down.

Bingo hesitated, probably fearing to present the product of his machine before a critical observer, then nodded to Monij. The short man flipped the yellow switch. The sentence appeared:

The sun begrudges him his shade.

The scholars cheered. I alone maintained an air of nonchalance. The sentence, while conveying a certain sense, bore no great wis-

dom. And given a sufficient number of random sentences we are bound to encounter a meaningful one eventually. Fortune can favor even fools; no Muse is required.

Monij crafted a weighty interpretation, then, on Bingo's command, flipped the yellow switch again. The light in the Ledger went off and there was another quick tapping as the Ledger released its spheres into the Outflow Bin. Then Monij flipped the green switch.

Spheres *wooshed*, the Ledger collected, Bingo hesitated, a sentence was displayed:

Looks can no more kill than smiles generate.

I was dumbstruck. If the last sentence narrowly missed the vein of truth, this struck it dead on. And with even a certain tone, not the pedantic one of a bland moralistic authority, but a sharper one, world-weary. I wondered which Editor had sent his Muse for this.

The next sentence—though grammatical—was disappointing, all the more so because Monij insisted on a strained interpretation. Bingo, glancing at me anxiously, cut him off before he could finish, then emptied the Ledger and produced the next sentence himself.

Eating your words gives scant nourishment.

The scholars clapped. I almost joined them. But a memory—or rather a sense of wrongness pertaining to the sentence as it was displayed—stayed my hands. I closed my eyes, concentrated, and just as a man who has drank too much pomegranate wine can by force of will summon the entirety of a phrase from the mere scrap originally attended to, I recalled the sounds the spheres made as they fell into the Ledger. It was a swift patter—but not so swift as to prevent analysis. I had heard more than six spheres: 15, or even 20.

I suspected that more spheres had dropped into the Ledger than words had been displayed.

Bingo flipped the yellow switch, dropping spheres into the Outflow Bin. Again they sounded more than six. The only true measure, however, would be an actual counting of the spheres as they lay resting in the groove.

When the next sentence (*Some deer donate fear*) had been completed, I strode toward the Ledger.

"Not so close," Monij said, blocking my way with his cane. "Your posterior, though certainly admirable, is not what the scholars came here to scrutinize."

I was not close enough for an exact count, but I saw the Ledger held many more than four spheres.

AT NOON WE ADJOURNED FOR LUNCH. THE SOUP WAS CREAM OF BARLEY, THE SANDWICHES BEEF WITH MELON PATÉ, THE CONVERSATION BRISK. MY CONTRIBUTIONS TO THE DISCOURSE WERE MINIMAL; I quickly ate, then, explaining I needed a nap, took my leave.

I did not return to my room. Instead, I hurried to the theater. No one was there. The next set of Editors would be beginning their shifts at 1:30. I would have an hour to examine the Grammar and Editing room at close range.

I did not need my scientific training to know that a deception had been played upon me.

With each new sentence, more spheres had fallen than words had been displayed.

First I examined the Outflow Bin. Like the Ledger it was handsomely constructed, an octagonal iron frame supporting panels made of polished walnut. Given 20 spheres for each five-word sentence, I reasoned the Bin would be close to full. I quickly disconnected the opaque tube joining it to the Ledger, then after some minutes of experimentation was able to unscrew the upper portion of the Bin.

The Bin had been emptied.

I reassembled it then looked closely at the Ledger. Bingo had paused for several seconds between generating a sentence and displaying it. I had thought his pause a sign of nervousness. Now I wondered if he had used that period to read the sentence as it was displayed in the groove, then somehow select a set of spheres to display. I wondered

OF CREATION, POSSESS ONE QUALITY IN THEIR FAVOR: THE

CREATIVE SPARK WHICH SETS TO FLAME THE BRAMBLES OF HABIT...

if he had played Editor. But I found no switches in the panel other than the three Monij had selected. Probably Bingo would have been incapable of creating a clever sentence, in any case.

As I went into the Editing room, I heard voices.

I sat on a chair, waited. Three or four minutes of silence satisfied me no one was near. I opened the drawer holding the Insulating Suits, then once again heard, faintly but distinctly, two voices, *coming from the receiving vent*.

I went to the vent. It was wide enough for any Muse; wide enough, in fact, to admit a man. I wondered if it did lead to the furnace. I crawled inside. The shiny metal was warm, and I smelled burning coal. Ahead the passageway narrowed slightly, continuing downward for three or four meters before terminating in a window. Refracted in it were the red and yellow glow of flames along with a pair of bright electric lights. The metal creaking beneath my weight, I crawled carefully to the window.

I looked down upon the furnace room.

The furnace was against one wall: a great wrought iron cabinet with five large vent lines articulating from its top, one of which, presumably, supplied hot air to the Grammar. A panel in the side had been opened, no doubt to facilitate the entrance of a Muse. Coal, falling through an aperture in one wall, was carried to the furnace by an iron-linked conveyor belt. The mechanization was impressive.

I could not immediately understand the other machine in the room. It was near the wall opposite the furnace; with its tall central pillar, surmounted by a broad mirror abutting the ceiling, it looked like the vanity for a Giantess. But the three dozen wires hanging from the mirror made it look like no vanity I have ever seen.

As I watched, the porter entered the room. He wore only an undershirt and trousers: sweat glistened on his bare shoulders. He glanced at the machine, called out something. A bright band of light came on across the length of the mirror; its reflective material apparently acted as an electric conductor. Looking up at this light, he pulled several of the wires in turn, lowering each a few centimeters. A pattern of dark squares appeared across the band of light. There were marks in the bright squares left behind; thinking they might be words, I moved closer so that I might read them. My face bumping into the window dislodged it.

The porter glanced at the conveyor belt, then returned his attention to the machine; the roar of the furnace had partially masked the sound of my misadventure. I saw I hadn't knocked the window loose but open; it had swung down on a hinge. I would need only to reach down and pull it closed when an opportunity presented itself.

Sticking my head out the breach I saw there were indeed words on the mirror: *Joy delivers savage harmony*. The sentence was cryptic, but as the porter yelled, "Calibrated!" I had an insight into the workings of the machine. Each dark square corresponded to a lowered wire. When a set of spheres came to rest in the Ledger, the entire sentence was first displayed down here. By pulling down the appropriate wires, the sentence could be pruned of nonsense. Only then were the remnants displayed on the Ledger.

The porter, not the Muse, was the Editor.

A voice—Bingo's—shouted, "Fine," and glancing once again at the furnace, the porter left the room. I hesitated, torn between the desire to immediately challenge Bingo on his deception and the curiosity to further observe the evolution of a myth. Challenge could wait, I decided; the myth would unravel on publication of my analysis. Now I would return to the theater.

But first to close the window. I reached down and pulled up at it. It did not move; either some mechanism within the hinge had locked it open, or it was simply too heavy to be closed by a single arm at an awkward angle. With difficulty I forced my head and other arm through the narrow frame. The leverage thus afforded, coupled with the secure grip of both my hands, should

have closed the window easily. It did not. I pulled first with a steady moderate force, then with a series of more and more forceful tugs, and produced nothing but a sharp pain in my right shoulder and an angry red crease in each palm.

When I tried to move back into the passageway I found that I was stuck.

I could not move forward or back; the frame was a cinch around my chest. Twisting merely broke a button off my waistcoat. No doubt a dispassionate, scientific mind-set would have suggested a solution to my predicament. But I heard a voice and, realizing Bingo or the porter would return to the furnace room soon, I panicked. I twisted, slapped the glass, rocked from side to side violently.

There was a crack, a sickening metal lurch, then the Muse passage collapsed beneath me.



IERMANN POSITS A SECOND SPHERE HELD WITHIN THE EARTH. ITS LAND MASSES SHIFTING AND UNCERTAIN, ITS RAINS AND OCEANS MOLTEN ROCK; VOLCANIC ACTIVITY ON HIS ACCOUNT IS THE expression of a storm so powerful it bursts through this inner earth's vault of sky. Upon waking from what surely was a concussion—my head throbbed—I found myself in what I thought was the second sphere. A lake of flames to my left, rubble of a broken continent to my right. And before me loomed a demon.

"Comfortable, Stavan?"

It was Bingo. His white vicar's suit looked crimson in the firelight. "I'm hot," I said. "And my—"

I moved to touch my head but found my wrists manacled.

"The furnace is hot," Bingo said. "But then what words could the Grammar produce without heated air?"

"You're talking," I said.

"And I have you to thank." Bingo gestured toward the rubble: I saw the timbers and twisted sheets of nickel I had brought down with me. About a meter of the passageway remained, held aloft by a single beam. "Your Muse, Stavan, shall inspire the Grammar to glory."

I was wearing an insulating suit, and heavy chains bound my ankles to the furnace. "I'm sorry about the damage," I said. "I'll reimburse you."

"And return to your garret to further slander my name?"

I shook my head, saw black shapes I could not read.

"I know you, Stavan. I know you think me an idiot. And I know you pervert your gifts in the service of what you call science. So think of this as your repayment: your Muse for once will be harassed toward a worthy cause. Not toward destroying a great idea."

I slid a little way from the furnace. "Your Grammar is a good idea. But it doesn't need a Muse." A wave of nausea hit me; I struggled to keep my train of thought. "It needs memory, experiences, hopes, regrets. It needs a speaker. Language is meaningful as it—" I shook my head—"as it allows the speaker to operate within the world. And reflect on it. Random strings of words will never mean—"

"There you are wrong! There you let your scientific prejudices blind you! For every string of words is rich with meaning! Every string of words has a truth or nuance that we can appreciate only if we bring the right understanding to it!"

Hot coal dust made me sneeze.

Bingo said, "You may sneeze, Stavan, you may sneer, but we are about to embark upon a grand venture together. With your Muse—and my improvements to the Grammar—we shall make sentences of everlasting import!"

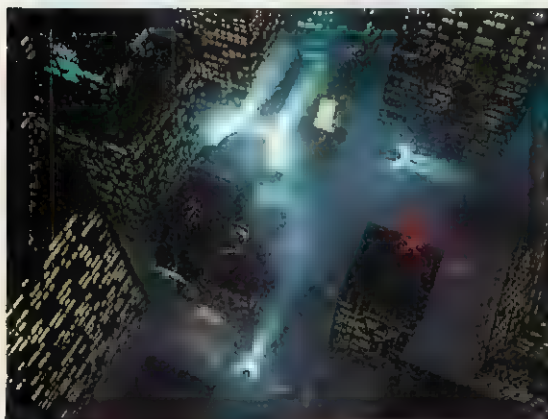
"I'm thirsty," I said.

"Don't worry—Monij will keep you hydrated!"

But Monij was nowhere to be seen—and for the next 15 minutes, the next hour, heat and concussion conspiring to distort my per

Continued on page 95

SF's great gaming franchises deliver new expansions for cosmic thrills.



Tex Murphy: Overseer (right), Mech Commander (below left), and the B5 Collectible Card Game Card Game (below right) all bring new energy to existing gaming universes.

THE SYSTEM REQUIREMENTS FOR *MECH Commander* (Microprose and FASA Interactive, \$54.99), the brand-new, real-time strategy computer game set in FASA Corporation's *Battle Tech* universe say that you need a P133 and 16 megs of RAM to run it. You don't. If you are like me and have been

hanging onto your old P100 processor while spending your money on RAM, hard drives, and a 3-D card, then the game runs just fine. The animations were smooth and detailed, the game play sharp and responsive. The longest part on my machine is waiting for the levels to load, but that has more to do with my insistence on using minimum installs than the age of my processor.

Mech Commander is both fun and easy to learn. It comes with a hundred-page rule book, but you don't even have to glance at it to start playing. There is a cheat sheet that you can spread before you and a lot of on-screen help. Even the opening cinematic sequence helps you learn the game. The hero of the movie is using the same interface you are. He can talk back to his mechs and he uses a light pen instead of a

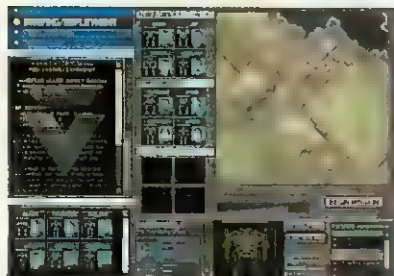
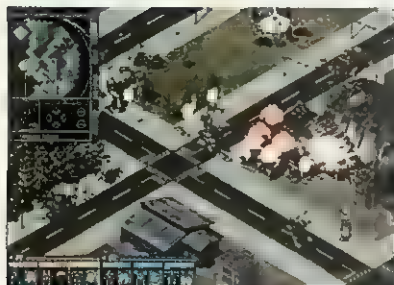
mouse, but he's doing the same things you will be.

The start screen takes you to the mission briefing. Once you've listened to that, you can begin arming your mechs. The interface for buying and equipping your forces is wonderful. It is both intuitive and requires no record-keeping of the players' own. The computer keeps track of money and space and inventory. When you have your fighting force prepared, you click on the drop button and the mission begins. The first mission is very simple, and the enemy is over-matched. Not much strategy is required to blast your way through, but by the end you have a pretty good feel for the controls. What you're fuzzy about, you can go find in the rule book, using the index to turn to the entries you need rather than having to read the whole book.

A very slick and attractive package, *Mech Commander* combines excellent graphics and animations with a simple, playable interface. Despite the fact that you are dropping into a game world with 15 years of history behind it, you can be up and playing the game well within minutes of installing it. Mastering the game tactics and working around its flaws takes longer to master, but if you have always wanted to lead units of giant robots into combat, then *Mech Commander* is an excellent way to simulate it.

Tex Murphy: Overseer (Access Software Incorporated), is another game with some history behind it. In 1989, Access Software released the first *Tex Murphy* game, *Mean Streets*, which was followed by *Martian Memorandum*. In 1994, Tex appeared in *Under a Killing Moon*, the first of his games to employ 3-D rooms and name actors. 1996 brought *The Pandora Directive* and now 1998 brings the latest installment. Told in the form of an extended flash-back, *Overseer* is the story of Tex's first case on his own, and it answers the questions of how he met Chelsea Bando and how he married Sylvia Linsky. It is also an interactive computer role-playing game that allows you, the player, to solve the mystery of what really happened to Sylvia Linsky's father.

Like most computer RPGs, *Overseer* is a combination of quick-time movie cut scenes, pick-your-question interviews, and hunt and click environments. What is unique is that *Overseer* excels in all three. For the movies, Access hired a fine assortment of talent including Michael York (recently seen on *Babylon 5*), Rebecca Broussard, Henry Darrow (Commander Chakotay's father on *Star Trek: Voyager*), and my personal favorite, Hong Kong and Australian martial arts star Richard Norton. Chris Jones is back as Tex Murphy, and he has a lot of fun playing both the cynical, world-weary Tex of the present, and



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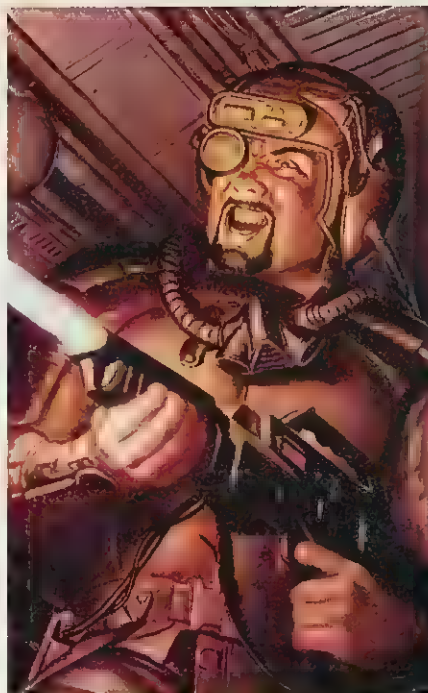
THE GREAT WAR

Series created by Michael Straczynski.

the naïve, hopeful Tex of the flashback. All the other actors (there are 30 speaking parts) do a good job, and they are a refreshing mix of men and women, young and old, skinny and heavy. Basically the people in Tex's world look more like the people in your own world than do the casts of most movies. It's a nice touch that helps make the game more believable.

The pick-your-question interviews are also a pleasure. The computer keeps a notepad with a list of all the relevant topics that Tex has heard about as he proceeds through the adventure. You can ask any character about any of the topics, and the computer checks off the answers you've already heard. The point of most of the interviews is to get the character to tell Tex about a new location and what to look for when he gets there. Of course, before you can ask the characters questions, you have to convince them to talk to Tex, which you do by picking and choosing through a conversation path. There are usually four choices at each branch, and they range from funny to threatening. They aren't hard to tread, but they are fun.

The hunt-and-click environments are the heart of the game. They are at the same time the most technologically advanced phase of the game, and the most annoying, the reason being that they are "fully interactive," in the computer game sense of those words. You can crouch down to look under tables and chairs. You can open and close drawers and



ABOVE: *Alternity* reinvents the future.

cabinets. You can move pictures and furniture. In other words, you can't just stand in one place and move the cursor around with your mouse to find the clues. You have to actually search, "physically" search each location in the game, and some of those locations, like the Anasazi ruins, are big. Luckily, there

is an online hint system that can get you most of the things you have overlooked, because believe me, you will miss things.

Overseer is a terrific game with lots to do and a highly entertaining interface to do it with. I recommend it with only one warning. There are basically two stories in the game: the modern one and the flashback one. They each have their own ending. The flashback has a fine, fitting ending that does justice to all the work it takes to reach it. The modern story's ending is best described as frustrating. Without giving anything away, I'll just say that not all the questions asked in the modern story are answered in this game. I don't know why Chris Jones decided to end the game this way, but he did, letting a great game end on a downbeat note.

TSR attempts to duplicate the market dominance of its *AD&D* franchise in science fiction settings with the release of its *Alternity* system. Like *AD&D*, the basic *Alternity* system is contained in two big books, the *Gamemaster Guide* and the *Player's Handbook* (TSR, Inc., \$29.95). To this will be added monster manuals, campaign supplements, gamemaster screens, and so on. The screen and the first campaign setting, *Star Drive*, are already out, with more to come as TSR continues its frantic publishing schedule. Their hope is to make *Alternity* the dominant system in a role-playing genre that has been without a dominant game since GDW folded up its *Traveler* universe. Is *Alternity* good

**The CIA is after him...
The KGB thinks they're
controlling him...**

**The problem is...
there are two of him!**

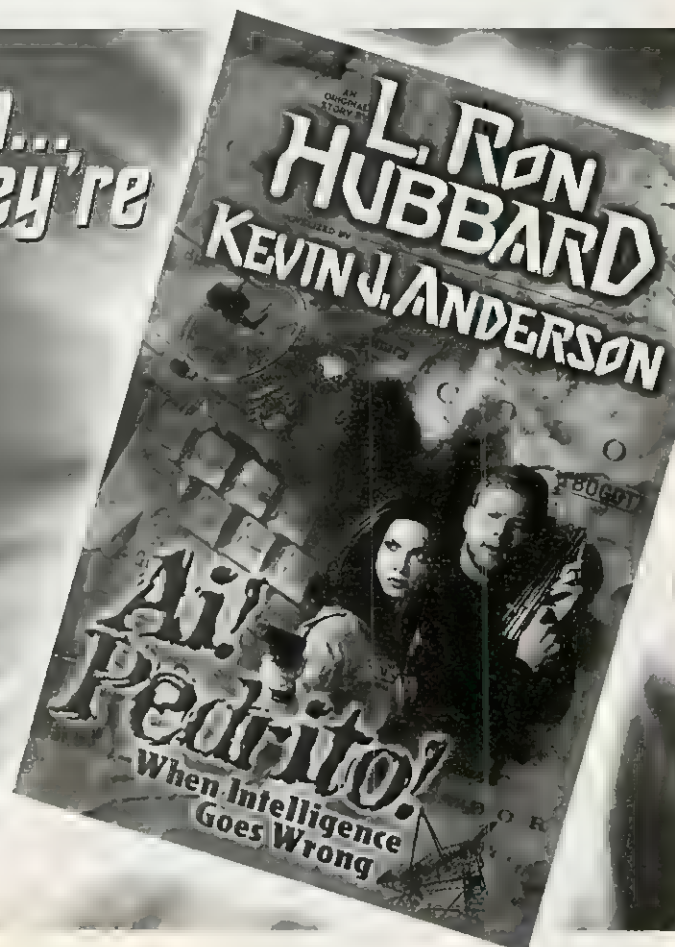
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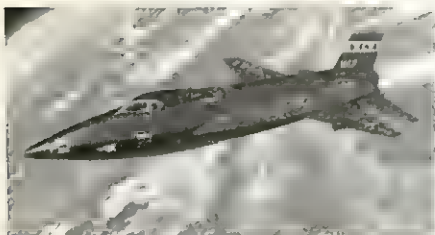
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ABOVE: CorpVDS helps get things rolling.

enough to conquer the SF genre? Not to my taste, but it does contain everything you need to run a campaign in the near to far future.

The rules themselves are OK, but they are hampered by a silly dice-rolling system. Whenever a die roll is called for, the player rolls two dice: a 20-sided control die and a situation die, so called because its faces and number depend upon the difficulty of the roll. In most systems, the GM sets a target number (usually the character's skill) and asks the player to roll under or over it (depending on the system). The die roll is either added to or subtracted from based on how hard the task is. *Alternity* is the same, except that the GM modifies the roll by "dice-steps," which change the situation dice. For instance, a two-position shift from even means the player is rolling a six-sided situation die instead of rolling no dice. Three shifts are an eight-sided die, and so on. The best positive modifier is one 20-sided die and the worst negative modifier is three 20-sided dice.

This is, as I said, silly. It is piling randomness on randomness for no purpose. It takes tasks that should be nearly automatic and makes them risky while taking tasks that should be nearly impossible and making them

merely unlikely. With the way that the skills and shifts are structured in *Alternity*, you could do away with the situation die, read the shifts as straight pluses and minuses to the basic roll, and have a much more playable game. It is hard to understand why Richard Baker and Bill Slavicsek settled on this mechanic. The fact that *Alternity* uses both classes and levels might lead you to think that they were trying to create a game friendly to AD&D players. If so, why did they change the dice mechanics?

The first words in Greg Porter's 158-page *CORPS VDS: Vehicle Design System* (BTRC, \$20.00) should probably be, Don't panic. In the course of those pages, Greg describes with mathematical precision how to design every vehicle imaginable from row boats to starships. You can use his rules to compute the characteristics for any craft from any genre and any time. You can use these vehicles not just with *CORPS*, but with any rules system, because *VDS* generates real-world characteristics that can then be simulated in any games terms. Top speed, for instance, is told not as "hexes per round" but in "meters per second." To create this sort of detail Greg has amassed a scary array of tables, formulas, and examples. The design sheets have room for 23 characteristics, and that is just scratching the surface of the details you can generate about a vehicle.

If you have trouble finding *VDS* in your local store, you can pick up an electronic, hyperlinked version from Hyperbooks (<http://www.hyperbooks.com/>). Unlike most online bookstores, there is no shipping charges and no waiting for the mailman. You simply send in your order and within a day Terry Austin will either E-mail you the book, or send you a code so you can download it.

The *Great War Expansion Set* (Precedence Publishing, \$8.95) for Precedence Publishing's *Babylon 5 Collectible Card Game* will feature 350 all-new cards sold in 60-card starter decks and 10-card booster packs. Two new preconstructed starter decks ("Home Factions" and "The Non-Aligned Worlds") will be offered at a suggested retail price of \$8.95 each. Fifty of the cards in each *Great War* deck will be "fixed" cards found only in a deck of that type. The remaining 10 cards will consist of a random assortment of rare (two) and uncommon (eight) cards inserted to make each deck unique. The booster packs will retail for \$2.49 and contain a random assortment of two rare, two uncommon, and six booster common cards per pack. An undisclosed number of cards autographed by actor Peter Jurasik ("Londo Mollari") will be randomly inserted into *Great War* booster packs.

Built on previous Precedence releases, *The Great War Expansion Set* represents the climactic war between the galaxy's two most ancient and powerful races, the Shadows and the Vorlons. The players take the role of the young races (Humans, Minbari, Centari, etc.) who must choose a side or find their own path to victory. □

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IN FUTURE

Continued from page 42

wait. The transformation is spreading backward, cascading these glimpses of novelty into our own era."

"But how is that possible?"

"A few days ago I would have said it wasn't possible. But we're limited by our linear view of time. Quantum scientists are already producing examples of nonlocal causality. In future, scientific theory may allow for backward causality. Who knows?"

"All right," the President said, decisively. "We'll worry about what's causing it later. Right now we have to get to work on stopping it."

"We have some ideas. Perhaps some kind of shield would protect people, cutting off the information flow."

But the President was no longer listening. He was staring, intently, at the video console embedded in his shoe.

"Sorry," he told the science adviser. "Got to run. Logjam in the Senate on that appropriations bill, I've got to twist a few arms."

He got up and crossed to the teleportation unit.

6. Greg stared at the giant wallscreen in the rec room, that had replaced his 32-inch Sony. It covered an entire wall, one that had been covered with fake wood paneling and decorated with Group of Seven prints. He had to admit that it was a definite improvement. Except that Monday Night Football had also been replaced, by some game like nothing he had seen before.

Men in brightly colored battle armor were zipping back and forth across a glassy surface, apparently on rocket-powered roller skates. The team in blue armor was competing with the team in green armor for possession of a large red ball that rolled back and forth, apparently of its own volition. The men carried sticks that emitted blasts of blue light at their opponents.

The carnage was amazing.

Greg could not follow what was going on, but it was exciting all the same.

"Greg," his wife called from the top of the basement stairs. "We've got to get going or we'll be late for the PTA."

"In a minute."

"Now," she said. "Turn off that nonsense right now."

Reluctantly he told the screen to turn itself off.

"The trouble with you," he told her as he climbed the stairs, "is that you're living in the present."

7. Jean's daughter Melinda had found a new drug. "Oh mom," Melinda told her,

as she came in the door, "you look terrific with that third eye. And those 12 inch platform shoes."

"You're just flashing," Jean told her, as she leafed through the mail. "It'll be over in a minute."

But hours later, at the dinner table, Melinda was still going strong.

"Oh wow," she said, staring at her burger. "That's some beautiful singing tofu. What is that—Bach?"

"Your food is singing?"

"Like an angel."

Jean stared hard at her daughter. Not again, she thought.

"Have you been taking acid?"

"Oh mom, no one does acid anymore."

"E?"

"E is over with. At the clubs we all do T."

"T?"

"Time Enhancer. It's the best. You flash longer. Not for a few minutes, not even for a few hours, but all day. You stay in the future."

"And that's good?"

"It's the greatest, mom. The future is just so . . . great."

8. "We're pleased to announce," the President said, "that a solution to this crisis is at hand."

Dr. Fishbein closed his eyes and opened them again. His TV set was still an early '90s Toshiba. But the President was definitely wearing some kind of hairnet.

The President pointed to his head. "The anti-TDS shield screens the wearer from erroneous future-based information. This triumph of American inventiveness is going into mass production immediately, in a variety of attractive styles and colors. By the end of the year, every citizen will be protected from this bizarre infestation."

Dr. Fishbein turned off the TV.

It was probably for the best, although he for one had rather enjoyed his future flashes. And he had got a lot of compliments on his teeth.

9. "Normality has been restored," said the TV newscaster in the goofy-looking metallic hat. "Across the nation, it's back to business as usual."

Greg adjusted his own anti-TDS screen. He had opted for a top-of-the-line lightweight mesh cap. Still, it was uncomfortable. And it was annoying to have to wear it all the time.

He picked up a handful of peanuts from the coffee table, but they tasted stale. It had been a while since he had had a decent food pill.

The room was dull, boring, cramped, the TV set too small to be worthy of serious attention.

He took off his hat and leaned back in his recliner.

He wondered what would be on the wallscreen tonight. □

MECHANICAL GRAMMAR

Continued from page 89

ception of time (and no doubt of Bingo, for how the fool could become so suddenly articulate)—my captor regaled me with his vision of an improved Grammar. Huge cylinders, each able to hold a hundred thousand spheres, would be installed; vocabularies would be expanded proportionately; a profusion of new connections would be built. With these added components the Grammar would become multilingual, able to create sentences in any known language at the flip of a switch. Ultimately the Grammar would be further enlarged, Old Chutney filled with cylinders and connections multiplied, until the machine was capable of another, more astonishing goal: the production of sentences *in all possible languages*. Dead languages, unknown languages, dialects and idiolects, languages as yet unborn: all would have their sentences invented by the Grammar then recorded into books. Even the inhabitants of other worlds (whose existence Bingo, probably having read one of Monij's tawdry romances, seemed certain of) would have their languages represented.

And my poor Muse would provide inspiration.

Bingo seemed demonic again, hot air seeming to shrink then enlarge his form grotesquely, his long shadow, cast by the furnace light, malevolent upon the broken timbers. I feared he might feed me to the flames, and that he had invented a new logic in which my best arguments would prove useless. About then Monij came down the stairs. He held his cane in one hand and a platter with a human head on it in the other.

"Just in time," Bingo said. "Mr. Stavan's about to faint."

The "head" was one of the Insulating helmets, rubber bottle with drinking tube strapped atop it. There were two tumblers on the tray as well.

"I took the liberty of preparing an electrolyte-rich solution of vitamin juice," Monij said to Bingo. "I was afraid the heat might bother you."

"Our new associate should be served first."

Bingo pushed the helmet onto my head. I felt a moment of claustrophobic terror, then he pulled up the visor and pushed the tube into my mouth. I sucked eagerly. The fluid tasted like sweetened water, though it had an odd, stale aftertaste.

Bingo watched me as he drank from one of the tumblers, the ice cubes inside bright as embers. Had I had my wits about me his scrutiny would have been unbearable; his was the delighted gaze of a child who had pinned a living bug to a corkboard. When I finished—the bottle empty—he said, "Tell Stavan about the special ingredient in his vitamin juice."

Monij said, "The juice contains a paralysis inducer. Voluntary motor movements are prevented."

Tears welled in my eyes. Paralysis was a cruel redundancy.

"And how soon will it take effect?"

Monij consulted his pocketwatch. "Right about now."

Still clutching the tumbler, Bingo fell onto his back.

I HAD NEVER THOUGHT I WOULD NAME MONIJ MY HERO. BUT HERO HE WAS: REMOVING MY FETTERS, HELPING ME OUT OF THE INSULATING SUIT, CONVINCING THE PORTER FIRST THAT Bingo had canceled the Grammar sessions until the Muse passageway could be repaired, and second that I had been expelled from Old Chutney and that he (the porter) should drive us with all due speed to the train station at Adroque. The ingenuity of Monij's lies and the grace with which he delivered them were admirable. More admirable still was his willingness to put aside our professional resentments, and his courage in forsaking the good will of his benefactor. There is truly the heart of a giant in the chest of the little man.

But Monij is not without flaw. As we rode the express to Wencleaseo, he told me that his actions of the afternoon had not been unusual; he always operated according to the principles of self-interest; he had long ago judged Bingo to be unstable, and knew he might have to leave Old Chutney at short notice. The events of the afternoon had merely provided him a pretext for escape.

I had taken his remarks for a rare kind of modesty. Only today have I come to understand the deeper truth behind them. I woke this morning to find two documents resting on the nightstand beside my bed. One was the advance proof of Monij's newest book, *Mechanical Mentation*. The other was a letter from Bingo's solicitor. Neither had been there when I turned off my lamp before retiring.

The book is colorful, rife with sloppy speculation, and most notably has a long chapter which offers only praise for Bingo's Editing Room. The letter threatens civil action if I publish any essay "disparaging to Dr. Bingo's character."

Monij is sincere in his pragmatism. His readers will fill his pockets with gold, he will regain Bingo's good graces, and science will lose another battle. I too find pragmatism tempting. I cannot afford a costly court battle; and however laughable Bingo may appear, his reach is long. That an intruder could break silently into my apartment as I slept is more frightening than a printed threat could ever be.

But I will not choose silence. Truth is not a random sentence. Neither is it the string of words most profitable to the speaker. Rather it is those words, soberly delivered, that best fit the things described. And it is such words I shall deliver—my report shall contain a true and factual analysis of the Grammar and the Editing Room, including the potential and the shortcomings of both. If I do not mention Bingo that is because the natural essayist should write about science, not its practitioners.

And if I do not praise the idea of the Muse, that is because we should not allow a myth to prosper. □

DANCE TO STRANGE MUSICS

Continued from page 75

racking, unbearable. Their distinct impression was that the first expedition now manifested as like the *tile-things*. Such testimony was often followed by an involuntary twitch.

Tapes do not yield such an impression upon similar audiences: they have become the classic example of having to be in a place and time to sense the meaning of an event. Still, the tapes are disturbing, and access is controlled. Some Earth audiences experienced breakdowns after viewing them.

But the second expedition agreed even more strongly upon a second conclusion. Plainly, the *Adventurer* expedition had joined the computational labyrinth that was Shiva. How they were seduced was never clear; the second expedition feared finding out.

Indeed, their sole, momentary brush with {—John/Odis/Lissa/Tagore/Cap'n...—} convinced the second expedition that there was no point in pursuing the maze of Shiva.

The hostility radiating from the second expedition soon drove the hexagonals back into their ship and away. The fresh humans from Earth felt something gut-level and instinctive, a reaction beyond words. The hexagonals retreated without showing a coherent reaction. They simply turned and walked away, holding to the four centimeter spacing. The 1.27 second flicker stopped and they returned to a bland expression, alert but giving nothing away.

The vision these hexagonals conveyed was austere, jarring... and yet, plainly intended to be inviting.

The magnitude of their failure was a measure of the abyss that separated the two parties. The hexagonals were now both more and less than human.

The hexagonals left recurrent patterns that told much, though only in retrospect. Behind the second expedition's revulsion lay a revelation: of a galaxy spanned by intelligences formal and remote, far developed beyond the organic stage. Such intelligences had been born variously, of early organic forms, or of later machine civilizations which had arisen upon the ashes of extinct organic societies. The gleam of the stars was in fact a metallic glitter.

This vision was daunting enough: of minds so distant and strange, hosted in bodies free of sinew and skin. But there was something more, an inexpressible repulsion in the manifestation of {—John/Odis/Lissa/Tagore/Cap'n...—}.

A 19th-century philosopher, Goethe, had once remarked that if one stared into the abyss long enough, it stared back. This proved true. A mere moment's lingering look, quiet and almost casual, was enough. The second expedition panicked. It is not good to stare into a pit that has no bottom.

They had sensed the final implication of Shiva's evolution. To alight upon such interior

worlds of deep, terrible exotica exacted a high cost: the body itself. Yet all those diverse people had joined the *syntony* of Shiva—an electrical harmony that danced to unheard musics. Whether they had been seduced, or even raped, would forever be unclear.

Out of the raw data-stream the second expedition could sample transmissions from the *tile-things*, as well. The second expedition caught a link-locked sense of repulsive grandeur. Still organic in their basic organization, still tied to the eternal wheel of birth and death, the tiles had once been lords of their own world, holding dominion over all they knew.

Now they were patient, willing drones in a hive they could not comprehend. But—and here human terms undoubtedly fail they loved their immersion.

Where was their consciousness housed? Partially in each, or in some displaced, additive sense? There was no clear way to test either idea.

The *tile-things* were like durable, patient machines that could best carry forward the first stages of a grand computation. Some biologists compared them with insects, but no evolutionary mechanism seemed capable of yielding a reason why a species would give itself over to computation. The insect analogy died, unable to predict the response of the polygons to stimulus, or even why they existed.

Or was their unending jostling only in the service of calculation? The *tile-polygons* would not say. They never responded to overtures.

The Circular Ocean's enormous atmospheric laser pulsed regularly, as the planet's orbit and rotation carried the laser's field of targeting onto a fresh partner-star system. Only then did the system send its rich messages out into the galaxy. The pulses carried mind-packets of unimaginable data, bound on expeditions of the intellect.

The second expedition reported, studied. Slowly at first, and then accelerating, the terror overcame them.

They could not fathom Shiva, and steadily they lost crew members to its clasp. Confronting the truly, irreducibly exotic, there is no end of ways to perish.

In the end they studied Shiva from a distance, no more. Try as they could, they always met a barrier in their understanding. Theories came and went, fruitlessly. Finally, they fled.

It is one thing to speak of embracing the new, the fresh, the strange. It is another to feel that one is an insect, crawling across a page of the *Encyclopedia Britannica*, knowing only that something vast is passing by beneath, all without your sensing more than a yawning vacancy. Worse, the lack was clearly in oneself, and was irredeemable.

This was the first contact humanity had with the true nature of the galaxy. It would not be the last. But the sense of utter and complete diminishment never left the species, in all the strange millennia that rolled on thereafter. □

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STEPS FALTERED

Continued from page 66

the air of many sensors in many lands. Do you understand?"

"I wish I could see myself in a mirror."

"You can." And Fazio pointed to the farthest wall of the vault. It was gray concrete; it bubbled into a shining reflection, and I stared.

A light stared back at me. Not the glare of a sun, but the light of overlaid lapidary potentials, the shine of human harmonies, reflected in a kaleidoscope of clothing and gesture and stance and stare. The ronin in full armor, the dancer, the Mongol, the seductress, the dragon rider, the hellbird, the duke of lightnings and the ace of dawn, all shed the heat of my own smile back on me, laughed at me, beckoned to me, shouted joy.

One moment: I inhaled Sydney's lilac-scented air, and tasted the snow-bitten sunrise of Irkutsk; wines of Bordeaux washed a spring tide on my tongue, and children of Borneo laughed little bells; whales crooned through salt spume off Okinawa, and a woman sang melting angular tones in Kirghiz; at a dance concert's final flourish, a thousand throats roared joy; a lark looped and scribed a red horizon moon; an astronaut's Mars-bound heartbeat danced thrill and peace.

"My God," I said in awe.

"Well, angel, at the very least," Fazio chuckled. "What kind of angel will you be?"

A new idea came. "Do you think there's others?"

"Yes. There are. I wanted to ask you if you'd help me find them and bring them out of hiding."

"Are you asking?" At that moment, I knew I'd do anything for him. My lice were fading.

"Yes." The corner of his eye, where my shuriken had struck, was healing.

"Yes I will. Just tell me what you want."

"First, go back to the royal city of Hué and find Quinh Mai. The two of you have a lot to say to each other." We stood; he opened his arms, and we embraced in the North Dakota vault. "When you are ready, come to me for work. I'll be waiting." The smile on his face lifted the years away, and he was young.

Confidence trickled into me. "No need to wait," I said, and I spoke one encrypted garb word, and Fazio's mirror shimmered, and Mai stepped through it.

"Arthur." She stood waiting, wearing the simple white *ao dai* that showed her beauty.

"Mai. I know now what I am, and what I'm not. I've done a lot of bad things."

"I know. I lied for you. I hid your tracks from the EU. They have called me your electric whore. My family has disowned me." Her words came flat, controlled.

Taken aback, I looked at Fazio. He looked back at me and said nothing.

"I want to set things right. Will this help?" And I flicked out the cards of the World and the Hanged Man and the Hierophant, and laid them across each other in the air, and a ripple

flew from the crossed cards out into the Web, and the healing began.

Fazio spoke. "That is for you and the world. What will you do for Mai?"

"I love her."

"And?" He challenged me; there was much to be said, and it still lay ahead of us.

"I'll make it right."

"How?" Mai asked, her voice strained and angry. "Can you make my family love me again?"

I had forgotten how such things mattered. "No. But I want to be yours, if you'll have me. That's why I'm here now."

"How can I trust you?"

Fazio said, "Why ask him? Either you will or you won't. It's a one-bit choice."

I said, "You know all that I was. Is that what you see now?"

She stared at me for a long moment. Her face finally rose from frown to smile, then clouded over again. "But what do we do? How can I be with you now?"

"And how can I be with you? I'm not a man, right?"

"Not just a man," Fazio corrected.

"Here our steps faltered," I said, that newfound confidence waning.

She turned to Fazio. "What can we do... here?" She blushed.

"How should I know? That's yours to find out." He vanished, laughing softly.

"Don't leave," she called to his fading image.

His words floated back from mid-air, "I'll be around."

My heart hammered. Humbly I asked Mai, "What is your wish?"

Her head bowed, she whispered, "That you can fill me, and we can stay together. Terrible angel." And she opened her arms and raised her face to mine. Tears tracked her cheeks; she had lost so much.

I moved to her; in royal red Hué I found her sweet and living body lashed in its sensos; from across the Net of light I gathered her flickering sendings. A soft touch on her skin, a symphony of sense that drew us into resonance, brought me into her. She embraced me with every cell, every pulse of her being.

We loved.

Together we called an egg from her treasure-hoard, and we teased it into life and skinned it with my geneprint, and the life took root in her, and we laughed fountains of shining sparks for ecstasy.

Here in the meshes of cyberspace, was it ticking days, or seconds, or nanoseconds? My fresh-discovered world pulsed and throbbed and inhaled; stars birthed and bloomed gently in a dark roof of expectancy. Somewhere very far off, Fazio smiled, and I knew much work lay ahead. Slimed with starlight, deep in the Dakota earth, cloistered in Hué, dancing in the many-pointed weave of the Geo-Syns, my love and I held hands and faced each other glowing, and the now-recovering Web pulsed through the space around us, and through our beating veins, and through my new and brilliance-bearing soul. □

SCIENCE

Continued from page 32

more obtained. For example—robot explorers and soil sample returns. We must build more efficient launch vehicles, and in five years we will know whether the design for X-34 performs well.

SF AGE: If I gave you a blank check and told you to do whatever you wanted to in space, what should we be doing now?

DURANT: First, make studies to bring up to date some of the concepts for Mars and lunar explorations that were pretty well investigated 15 years ago by the National Commission on Space. Use new knowledge of technology and turn about half the current budget money back to the taxpayer. We don't need budgets like that. We don't need 150 astronauts! I'd simply cut them back, and give them other work. Keep five or 10 in good physical shape and flying high-performance aircraft and so on.

SF AGE: How did we get from there to here? Why do we have so many in the first place?

DURANT: Because NASA plans some 70 shuttle flights for building the space station over the next five years.

SF AGE: Do you have any comments on *Mir* and its problems?

DURANT: I've met quite a number of the cosmonauts during eight visits to the Soviet Union at conferences going back to '61. I've met most of the foreign cosmonauts as well: Cuban, German, Polish, Rumanian, North Korean, North Vietnamese. All of these chaps are ex-test pilots. They all were at the top of their profession in military flying. And as test pilots, they all had the same general attitude—do what needs to be done. They've accepted the risks involved. You ask about *Mir*. I'm amazed that we made the last two visits to that spacecraft. It's falling apart.

SF AGE: Why is it that the Russians have *Mir*, and we don't have anything on our own?

DURANT: The only space station we had was Skylab. We had about three months up there, while the Russians have had years of experience.

SF AGE: Is that because we spent too much time on the Strategic Defense Initiative?

DURANT: No, we didn't spend enough money on SDI! Right now, we've got the same question being asked in Congress. "Is there anything that can stop a missile attack on the United States?" And the quick answer is no. There's no program under way.

SF AGE: What opinions do you have on how well *Apollo 13* captured some of the feelings of the time? Was it an accurate film?

DURANT: It was quite accurate. It told the story of the gutsy way that the crew and the NASA Control Team worked out a real technical challenge without loss of life. They were outstanding test pilots and they did a damned good job. The U.S. astronauts that I know are as good as they come; top of the pyramid. □

TELEVISION

Continued from page 26

front of somebody who was touted as being near God in terms of his work at the FBI."

From Duchovny's perspective, Mulder is perhaps the hero who's best described as the antihero. "He is a loser. He just never succeeds, basically. He doesn't get what he wants. He doesn't win fist fights. He doesn't get the girl," notes Duchovny. "I like him as a hero because I always intended to play him as a guy who doesn't win but who seems to win. That is, I think, a difficult thing to do. People at home see that Mulder is right, so it's all kind of skewed in his favor. We've seen what he sees. We know that he's right, that his quest is good and moral and all of that. In that sense he's more of a straight-up hero."

As stimulating as the characters are, though, both actors admit to feeling the strain of *The X-Files*' intense grind, a strain which was only amplified by spending the hiatus between the fourth and fifth seasons filming the feature.

"Some days it's not fresh and it's not exciting. Some days it is. It usually has to do with the challenge of the material. If there's a difficult scene to do or a fun scene to do or a challenging scene to do—then it's fresh and exciting. If there are just five pages of backstory, dates, figures, numbers, or names, then it's just hell," explains Duchovny. "It's not really the show or Mulder. It's the bare fact of doing the same show and the same part for five years."

"I think that I have these survivor mechanisms that just kind of poke up and rear their heads," Anderson muses of the relationship between the grueling hours on the set and her performance. "Sometimes—a lot of times—I'm dead on my feet, and sometimes I phone it in and sometimes I have the energy to keep going and be better and better. It just depends."

With all of the key players, including leads Duchovny and Anderson and Carter, signed through seven seasons, the current expectations are that *The X-Files* will continue its fast-track run on television before releasing a second feature.

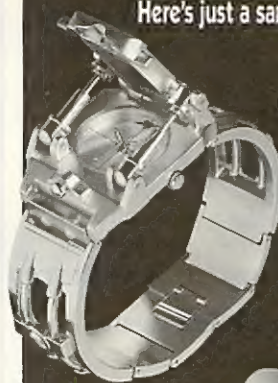
In the meantime, the show will strive to improve upon itself, completing its evolution from cult hit to mainstream phenomenon. Notes Duchovny, "It's fairly unique in the fact that it takes 100 clichéd elements, puts them all together and makes something new. It is the *Night Stalker*. It is sometimes a medical drama, as bogus as it can be. It's bogus in its chastity and its repartee between Mulder and Scully. And it's creepy for the kids. You take all of those things together and, somehow, it comes off as being fresh, unique and original. You could never have sat down and predicted it. It wasn't in the pilot I read. It's something that has grown as all of the ingredients in the show have grown, as Chris, Gillian, Rob, and myself have grown as performers, directors, writers, whatever. It's just become better and better." □

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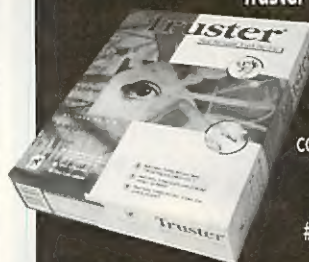
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INTERNET

By Cory Doctorow

JAMES D. MACDONALD AND DEBRA Doyle are a rare treasure: a couple who like each other well enough to collaborate. Their books and lives are enumerated in detail at their site, <http://www.sff.net/people/doylemacdonald/>. Don't miss their personal newsgroup, where they charmingly recount their daily round and interact with their fans.

Robert J. Sawyer's new site, <http://www.sfwriter.com> gets an E for effort. Rob's put an enormous amount of content relating to his work online: excerpts, illustrations; biographies, notes and so forth. However, while he may be a well-respected SF writer, an information architect he isn't—organizing this much content is a big job, and while Rob's given it the old college try, the site remains a little confusing and under-designed. Nevertheless, diligent fans will find a wealth of material here.

Nalo Hopkinson, recent winner of the Warner First Novel contest and author of the spectacular *Brown Girl in the Ring* isn't an information architect, either. Luckily, her partner, David, is. The site they've built together at <http://www.sff.net/people/nalo> is a delight to the eyes and the mind.

Lucy Snyder's Webzine, *Darkplanet*, is an ambitious effort. Using donated space from the good people at SFSite, *Darkplanet* publishes a ton of fiction on a pretty regular basis, at <http://www.sfsite.com/darkplanet>. The quality of the work is surprisingly high, if slightly spotty.

It's a truism that magazines and newspapers are in the business of selling advertising, not content—the cover price is a fraction of the overall cost of production. Taking this model to heart, Glen Hauman's *BiblioBytes* gives away hundreds of high-quality SF and fantasy novels—and cover the cost of publication with advertising. From Harlan Ellison to Ron Goulart, the thrifty SF reader will find millions of worthwhile words at <http://www.bb.com>.

The last time I was in NYC, I proudly showed off my PalmPilot to Tor Senior Editor Patrick Nielsen Hayden. Before leaving home, I'd loaded it up with twenty-odd elec-



tronic novels and dozens of short stories, drawn from various sites. The next time I talked to Patrick, he had a Pilot of his own, and now Tor is selling Pilot-readable versions of their bestsellers through Peanut Press, at <http://www.peanutpress.com>.

Whenever a news-crew is sent out to an SF convention, the first thing they do is zero-in on someone in an elaborate costume. There's no question that costumers are the most mediagenic segment of fandom, and the highlight of the costumers' social calendar is CostumeCon. Unfortunately, the CostumeCon site at <http://www.costumecon.org/> is a disappointment: there's an embarrassing absence of pictures, for one thing; and of introspection on the costumer's art.

Undead Theatre is everything that an amateur site should be: slightly ugly, awfully funny, and wonderfully creative. The Undead Theatre crew use their site (<http://www.olywa.net/zombified/undead.htm>) to self-publish little seven-minute videoclips they create by cutting up classic horror movies and dubbing in their own dialog and stolen music samples. Think class-clown meets *Mystery Science Theatre 3000*.

Richard Tibbetts, author of the forthcoming *Red Planet Pioneer*, wrote to me and asked me to take a look at his site, <http://www.redplanetpioneer.com>. I did. It's pretty. There's some neat stuff about the comic's backstory. You can buy t-shirts. But I left the site unsatisfied and wondering why there didn't seem to be any excerpts—no artwork, no text.

Equally frustrating is Warren Ellis' site, at <http://www.warrenellis.com>. Ellis' *Stormwatch* and *Transmetropolitan* series are some of the freshest, coolest comics I've come across in a long time, but the site barely hints at it. Exceptionally stingy with artwork and excerpts, warrenellis.com leaves the visitor with hardly an inkling of the depth of the work. □

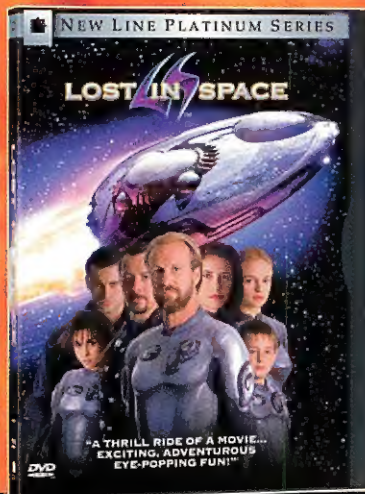


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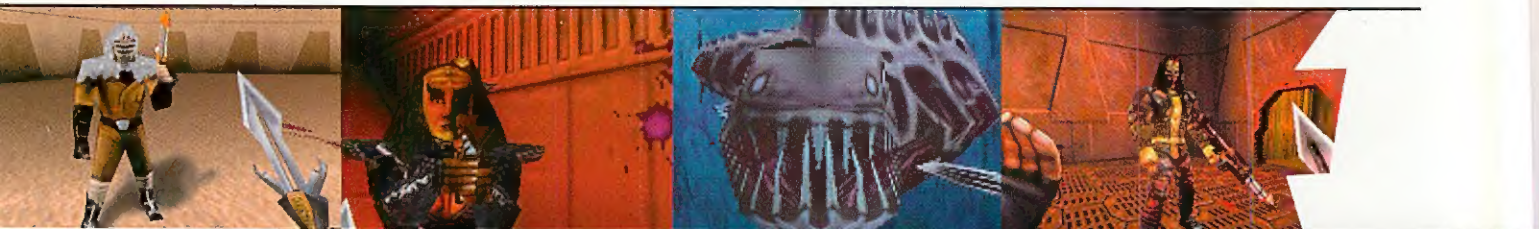
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